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ABSTRACT

Eight papers are presented from the 1995 CAUSE conference track on professional development issues faced by managers of information technology at colleges and universities. The papers include: (1) "Developing as Information Technology Professionals: Profiles and Practices" (Diane Balestri and Ruth Sabean), which discusses professional development in the Office of Instructional Development at the University of California-Los Angeles; (2) "Developing and Maintaining a World-Class IT Staff" (Elizabeth A. Murphy), which focuses on the development of a skills matrix to assess job performance and professional development; (3) "After IT Restructuring: What's Next?" (Susy S. Chan), which examines information technology restructuring at DePaul University; (4) "Transitioning the Organization: A View from the Inside" (Dean F. Duncan and Mary McMahon), on the merging of computing services and the library at Gettysburg College (Pennsylvania) into an Information Resources division; (5) "Something New! A Bachelor's Degree in Information Studies" (Gene T. Sherron) which describes program development at Florida State University; (6) "Taking Time to Train Students" (Jerry Martin), which presents techniques for the training of student support staff; (7) "Team Teaching the Internet: The University of Arizona Experience" (Ann Eagan and Louise Greenfield); and (8) "Supporting Information Technology--The Evolution of A Model" (Norbert Reidl and Andrew Zafiropoulos), which reports on the development of a help desk to serve students and staff at Victoria University of Technology (Australia). Some papers contain references. (MDM)

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TRACK 7

PROFESSIONAL DEVELOPMENT

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Developing as Information Technology Professionals: Profiles and Practices

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Abstract: IT professionals are too often narrowly defined by their particular expertise, even by the specific technologies with which they work. This categorization presents problems for managers responsible for integrating a broad array of IT staff into a cohesive unit with common missions and goals. It can also create severe obstacles for the professional development of individuals within IT organizations. This paper identifies four characteristics of the IT professional that generalize across platforms and technical expertise: customer orientation, creativity, collaboration, and communication. Implications of these characteristics for organizing work, for staff evaluation, and for professional development are outlined. A case study examines the particular challenges of infusing digital technologies into traditional technology support services, such as those provided by AV professionals.

Introduction

In the last decade, technologies supporting all aspects of higher education have proliferated, the number of technology users on campus has vastly increased, and their expectations have soared. Campus computing organizations have scrambled to keep up, in a rapidly evolving, centrifugal process that has spun our organizations and our staff further and further afield -- physically, technically, and psychologically -- as we attempt to balance service and innovation, to support the newest technology without abandoning the oldest, and to add or develop the needed expertise among our staff. This outward, centrifugal motion has created collisions with other organizations on campus that also acquire and deliver information -- the libraries, the AV departments, the television stations, to name a few. These collisions have sometimes been painful and confusing, sometimes liberating and creative.

For us as IT managers, this centrifugal motion within our own organizations, as well as the resulting collisions with other groups, creates many challenges. In this paper we focus on the particular challenge of enhancing the development of our professional staff members in this fluid and rapidly changing context.

We begin with the observation that professional staff are too often narrowly defined by their particular expertise, or even more narrowly by the specific technologies with which they work: we can easily identify "the UNIX gurus" for instance, and it's not hard to tell the AV technicians (the Old Media experts) from the New Media center staff, or the reference desk librarians from the computing center Help Desk professionals. They each have a unique vocabulary, a unique vantage point within the institution, and sometimes unique dress and work habits.

The specialized expertise of these diverse professionals seems necessary to provide first-rate customer service. But a narrow emphasis on specialized expertise as the primary characteristic of the IT professional can hobble the IT organization, making it difficult both for individuals to grow professionally and for the organization to respond quickly and with a clear sense of its mission as technologies evolve and customer needs increase and change. Furthermore, this emphasis on specialized expertise has led to subtle, technology-based class distinctions among IT professionals, with the result that as technologies merge, productive synergy between groups can be unnecessarily hard to generate. Where groups on collision course have been asked to cooperate or even merge, these distinctions have made collaboration difficult.

In an environment of endless technological change, continuing technical education for professional staff is important and necessary. But simply piling one training program on top of another does not constitute good professional development practice. Instead, IT managers need to counteract the centrifugal tendency with a converging, centripetal strategy that centers goals for staff development and performance on characteristics that generalize across particular technologies and expertise. The fact that previously distinct technologies are rapidly merging provides impetus for developing such a strategy, as services must be redesigned and yesterday's special expertise becomes obsolete or has value in a new context.

The professional staff members within an IT organization today can range from the UNIX-savvy Webmaster to the slide projectionist, from the presentation graphics assistant to the interactive graphics programmer, from the expert in audio systems for classrooms to the expert in database design. The profile described below attempts to enumerate and illustrate the common characteristics of these diverse professionals. The goal in developing this common profile is to help both staff members and managers understand the "expertise" of IT professionals as a broad set of skills that encompass much more than technical know-how. From this understanding can come better strategies for developing professional staff members and assessing their performance. This profile also provides the basis for establishing a common set of professional goals that will help staff members understand how they can work productively as a unit, and even interact more effectively with IT professionals in other groups and units.

Profile of an IT Professional

The profile of the IT professional includes these four primary characteristics:

- Customer-orientation
- Creativity
- Collaboration
- Communication

We will look first at each aspect of this profile in more detail, and then we will look at the ways this profile illuminates a case study in team-building, including specific practices, problems, and progress.

1. Customer orientation

Putting customers first is not a new idea, nor one that uniquely characterizes the IT professional: it is a primary quality of any member of a service organization. Each member of the IT staff, whether or not he or she deals directly with campus customers, should be expected to put the needs of campus technology users first. To serve customers effectively, IT staff need to:

* know what their customers need to do their work;
* serve the institutional mission as it is interpreted and implemented by those customers;
* focus on providing services "just in time" for a community that is incredibly driven by the time constraints of the academic year;
* foster independent use of technologies by customers.

Strong customer orientation integrates both the IT staff member and the IT organization into the routine processes of the academic institution, and can be a source of great professional satisfaction. But providing consistent and thorough customer service is a great professional challenge in an environment constantly in flux.

2. Creativity

The focus on customer orientation establishes the service component of the IT professional. Adding the second characteristic, creativity, affirms the simultaneous role of IT professionals as innovators, as leaders in the development and introduction of new technologies on campus. This element in the profile of the IT professional also needs to be articulated for every member of the staff, even those whose jobs seem most dedicated to delivery of quotidian services. This creativity, however, needs to be nurtured and exercised in the context of the institution's mission and available resources. For the IT professional, creative activity includes the ability to:

* anticipate customer needs;
* master appropriate technical skills, and teach or share new abilities with colleagues;
* identify and pursue innovative projects that generalize across broad segments of the institution and that fit the institution's mission;
* take a successful project and turn it into a service;
* extend a routine solution or a general purpose tool imaginatively to solve new problems in a cost or time effective way.

The exercise of creative talent is a powerful springboard for professional growth and infuses new energy into the IT organization. Innovative achievements inspire others, create new standards of excellence, and provide new options for customers. The challenge for managers is often how to nurture creativity in environments where resources are scarce and risks are seldom encouraged.

3. Collaboration

IT organizations and IT staff cannot operate successfully in isolation, and should not try to do so. We can no longer inhabit the silicon basements on campus, performing our wizardry darkly, even if benignly, on behalf of others. We must be out in the fray, perceived as valued partners of staff, of faculty, and even of

students. Collaborations leverage those scarce resources. Collaborations also provide both insight that drives the establishment of new customer services and fresh ideas that spur further creativity and innovation. IT professionals need to build collaborative relationships in every forum. They should be encouraged to do so with all of the following groups:

* with customers;
* with colleagues within their own organization;
* with other campus groups and offices;
* with colleagues on other campuses and in professional organizations;
* with vendors and other external groups.

Good collaboration builds teams that provide the IT professional with new knowledge, new models, and new perspectives. Collaborations offer the opportunity for valuable critique, for unexpected innovation, for the chance to share expertise and develop new skills. Collaborative activities can also be excruciatingly time consuming. Unless carefully managed, the processes involved in collaboration can overwhelm the goal, and frustrate staff rather than reward their efforts.

4. Communication

IT organizations usually maintain and develop the major communications media on campus, and so it is ironic that IT organizations and their staff members often fail to communicate effectively with one another and with their customers. The ability to communicate is critical to the success of the IT professional as an individual and as a member of the IT team. Communication includes a commitment both to listening -- assimilating everything that comes in from customers, from collaborations, and to sharing -- querying, responding, and informing, in a timely and graceful manner. The IT professional must be able to:

* listen to the customers;
* absorb and interpret institutional and national "messages";
* understand that the knowledge of the IT professional is not arcane or privileged, but should be shared in language that customers and colleagues can understand;
* provide IT services that are visible, accessible, convenient, and well-documented;
* see communication as a mutual process of timely teaching and learning.

Effective communication provides an essential flow of information within the IT organization as well as between IT staff and customers. But effective communication is hard to achieve. It requires both unusual honesty and great empathy. And it also requires technically adept staff members to relinquish their traditional posture as the expert and assume a new role as guide, colleague, and coach.

A profile of the IT professional that focuses on these general characteristics rather than on a particular technical expertise is useful for:

* articulating individual job responsibilities;
* providing specific goals for the professional development of individual staff members;
* evaluating professional performance and professional growth;
* establishing goals and priorities for the IT organization, so that the goals for individual staff members are given a supportive context;
* defining milestones for the IT organization's progress;
* building organizational unity and improving staff morale with a sense of shared vision and shared practice;
* finally, telling an organization's story, and analyzing its progress, by looking at some of the ways these professional characteristics have infused the processes of planning and implementation.

For an example of such an analysis, we turn to a case study of transformation and professional development in the Educational Technologies division of the University of California at Los Angeles.

A Case Study: Media/IT Professionals

First some background: In 1993, media services at the Office of Instructional Development (OID) at UCLA was a collective term used to refer to the various technology-based service units. Each with its own manager, who temporarily reported to the Director, the units had at various times in their existence reported to different levels of management (including different organizations) in a variety of combinations. Following an external review, the recommendation was accepted to organize these functional areas into one "Educational Technologies" division within OID.

On paper, therefore, the following functional areas were quickly merged:

* Audio Visual Services
* Instructional Media Production
* Media Systems Design
* Media Systems Maintenance
* Language Lab, Media Lab, Media Library, Teleconferencing & Satellite Services
* Photography & Graphic Services

And, a few months later, a new Assistant Director was hired to create a cohesive set of services, to integrate digital technologies into the service spectrum, to improve the quality of service, and to bring the units into fiscal soundness. Within the first year, two of the units (Design & Maintenance) were merged under a single manager and a new unit, Information Technology Systems, was added to the division.

The managers, most of whom had worked for the organization for more than 10 years (two for more than 20 years) were senior professionals in their area of media and service delivery. Although there were some unit interdependencies and opportunities for collaboration on a project basis, there had been no recent attempts nor programmatic design to exploit overlaps for either professional growth or service improvement and expansion. The managers viewed themselves first as media professionals with distinct areas of expertise (for example, a producer/director) and secondly as a manager. The professional development, therefore, had to include both the expansion from media to instructional technologies and from operational-supervision to managerial functions, such as program, service, and fiscal planing. Similarly, for members of these units, along with learning new technologies and how to integrate and deploy them, came the new imperative to think broadly across unit boundaries so that intersection of services was seamless for the client.

Adding information technologies brought a new set of customers and a new set of expectations which had either been non existent in the traditional media services, or were only present in a very small percentage of the customer base -- primarily those for whom the media was also central to their academic expertise. We have grouped these changes in customer expectation around four topics which we then use to illustrate the IT profile with the IT practice:

* Pervasive access: once aware of even some of the potential uses of IT, the customer quickly expects to find equally predictable accessibility in multiple, if not all, locations in which they need to perform their work. For example, whereas a faculty member may have been quite satisfied with (or at least willing to accept) having a film or video projector in only specialized locations, they rapidly came to expect predictable accessibility to hardware, software, and information in their offices, in classrooms, in labs, in dorms, in residences, etc. This expectation has also extended back to the traditional media equipment, such as overhead and slide projectors, which customers also now expect to find in every teaching location.

* Independent use: faculty, staff, and students were quite satisfied with (or at least willing to accept) the process of working through the media professional, whether to create, adapt or use media in traditional formats. In contrast, after only a modest amount of experience with IT, customers expect to be able to create their own materials, to function independently of an "expert", indeed, to become experts in their own right.

* Frequent change: faculty, staff, and students were quite satisfied with (or at least willing to accept) changes in the medium and projection equipment or film, video, slides; changes were incremental, occurred after many years and often had little or no impact on their own possessions, finances, or ability to incorporate content into teaching and learning. In contrast, changes in digital technologies impact faculty, staff, and students daily - whether potentially or in fact.

* Extensive choice: faculty, staff, and students were quite satisfied with (or at least willing to accept) the choices media professionals made for them or recommended to them. The variety of choices were fewer, their differences clearer, and the implications were fairly predictable. In contrast, the mix and match choices of IT (euphemistically captured in the "plug and play" phrase) seem infinite, the meaningful differences usually unknown, and the ramifications unpredictable, given the expectations for pervasive access, independent use, and frequent change . Right choices are less obvious -- maybe impossible, except for the briefest of time periods.

The Profile in Practice

The first step we took was to lay the groundwork for the division by writing a vision statement on which we could build a common set of goals for service and services. This vision statement focused on the client and the instructional mission of the larger organization; it made no mention of units.

Customer Orientation:

We have found that the customer orientation has had to increase, building on what was present and expected as media professionals, to include the ability to:

* serve a new customer base for whom media is IT while helping customers somewhat "stuck" in old forms of media to broaden their horizons;
* respond effectively to immediate service requests within the technological and programmatic context of the customer;
* maintain incredibly rapid and flexible adaptation of services while integrating a broader range of technology options;
* achieve professional growth and satisfaction through creating information and opportunities which enable the customer to work and learn independently.

Some things never change, they just increase. Both with media and with IT, engaging customers in the development process is the key to doing the right thing in the right way. For example, we started with the goal of helping faculty use IT in the classroom. Working with faculty "pilots", local support staff and various central services, we are now connecting classrooms to the backbone, providing laptops via audio-visual services, supporting the creation and

adaptation of materials, and developing production-level digital imaging services.

Creativity:

Overall, we have learned that adapting existing media services and developing new IT services happens more rapidly, must integrate a broader range of physical and technological options, and most certainly will end up incorporating several unexpected service outcomes. The fact that these media service units and professionals had a long established focus on supporting innovation in teaching made it possible to move more rapidly to develop long and short-term goals and begin implementing projects across unit boundaries.

Practice has shown us that our media/IT professionals must continually pursue:

* understanding major technology changes and how the campus is intending to or should integrate them; for example, our media systems design unit is currently testing options for delivering interactive video to the classrooms over ATM;
* mastering new technical skills, while "letting go" of the need to be THE expert and developing a readiness to share the role of trainer/consultant with both other IT professionals and customers with expertise;
* adapting or building on the ideas and work of others (including those of the customer) to create new access, new opportunities, new solutions.

An example of how a trend in one area can be applied to another is evident in our experience with fostering independent use. We found that the faculty's expectations to use computing independently may have enabled audio-visual services to help faculty learn to use almost all projection equipment independently. Not only has this resulted in an enormous savings in operational costs, it has also enabled an increased number of faculty to use media and technology in teaching.

Collaboration:

Organizationally, we elected NOT to create a "new media" unit while leaving the traditional media services unchanged. Instead, we infused changes horizontally across all units. For example, instructional media production also now provides consultation and fee-based services for the production of interactive multimedia. We also created an internal technology systems group to help us define technology standards, develop a technology infrastructure, support staff use of systems and networks, and plan pilot projects with the units.

When IT pervades services, we have found that there is almost never a time when, as media/IT professionals, we don't need to:

* talk with departments to understand what their technology and services plans are, where the hot spots are, and what plans are under discussion;
* connect with technology vendors and consortia to ensure that we know the big picture at least as soon as our customers do and invite them to become part of our innovations;
* work with peers and customers at other institutions to develop solutions (for their customers or our own) which enable collaboration among customers and sharing of resources.

An excellent example of such qualities in practice has been evident in the development of a center for faculty to experiment with digital technologies. It was created in consultation with faculty, departmental support staff, vendors, and other higher education institutions. In the operations, we find ourselves working with (on our campus as well as on other campuses) faculty, librarians, technology and media vendors, and publishers (to name but a few) while pulling in expertise and resources from across our own units, the campus and remote institutions.

Communication:

The new media/IT professional recognizes that they are part of a community of supporters, sometimes the expert, often the learner, ideally a peer - with information to share and understanding to gain. Given the imperatives of customer orientation, creativity and collaboration, we have found that information now is critical to the operation of a broader set of services, impacting an unknown number of customers, over a wider geographic area.

We have learned that the IT professional must be able to:

* share expertise or their services will flounder, their colleagues may fail, and their customers will surely go it alone or look elsewhere;
* provide chunks of accessible (both technologically and contextually) information which can be integrated on the fly to solve an immediate problem;
* meet the "just in time" approach of customers to look for answers when they need them and not when the expert is ready to publish them.

We have learned that the best way to grow expertise as an IT professional is to give away what you know so that others can use it and work effectively without you. The benefits are as important for the professional, who can move on to something new, as for the information consumer who is able to work more readily at their own pace.

Conclusion

We are now well launched into the third phase of expanding what were pilot projects to production services in every facet of our operations and services. For

example: digital imaging services in Photography, a faculty new media center in Instructional Media Production, desktop videoconference in distance learning services, multimedia delivery systems in the media lab and multimedia resources in the library. We are currently designing interactive video capabilities for classrooms, a multimedia development lab for students, a multimedia teaching lab to replace the aging language lab and a much expanded digital innovation center for faculty. Not one of these projects and services would have been accomplished without the collaboration and newly developed expertise of staff in multiple units, both within OID and on the campus.

Some measures of progress and success are already visible:

* fiscal soundness of the units as a result of streamlined services (including the phasing out or redefining of several), new services with revenue streams, and increased productivity;
* customer view of services has continued to improve on OID's previous fine reputation as a result of responding to outcomes of focused service evaluations and continual dialogues with faculty at every possible opportunity;
* involvement (as both initiators and collaborators) in key projects at both departmental and campus-wide levels with a broad range of customers and professional peers;
* support of key opinion and decision makers who have come to rely on the quality of the expertise and service;
* involvement of vendors as a result of increased visibility from services which are valued by individual customers and by the institution.

The rewards for the media/IT professionals are tightly connected to these milestones of progress and success:

* breadth and depth of expertise is increasing significantly;
* opportunities to be closely involved with new technology assessment and service integration;
* reputation and respect for quality service and professional expertise;
* opinions are solicited and collaboration is requested.

Phase three is, for better or worse, the phase which never ends. As experienced media/IT professionals, we will continue to improve our abilities to:

* understand the mission of the institution and the continual changes in progress to fulfill that mission
* listen to customers as they experiment with technology in teaching
* collaborate with a broader than ever group of peers and customers to provide an environment full of customized solutions
* contribute high-value information
* innovate, innovate, innovate.

Developing and Maintaining a World-Class IT Staff

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The shift of organizations from management-focused to team-focused and operated necessitates a vigilance in developing individual professional development plans for employees, particularly in the IT profession.

The trappings of success--a position in management, a corner office, and a long title--have been replaced by coordinated, project-focused work teams comprised of the organization's experts. This new environment leaves employees questioning their value, if not their roles, in the organizational structure. Without the common measurements of success, employees struggle to identify their contribution to the organization.

Skills assessment and professional development planning are essential to developing world-class employees for a world-class organization. The skills matrix that will be presented will help to identify the strengths and weaknesses of your current IT staff as well as provide a template for the makings of the ideal IT department. The matrix also serves as the cornerstone for individual professional development plans focused on ensuring each employee's value and contribution to the organization.

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Developing and Maintaining a World-Class IT Staff

The twenty-first century ushers in with it a new way of looking at professionalism. In a world where cubicles have replaced corner offices and titles are often omitted from business cards to make room for an Internet address, how is the average employee supposed to know she's *made* it? The trappings of success, particularly in the higher education environment where the average computer center is seated several feet below street level, are evaporating. Traditional measures of success are being cast aside in favor of more subtle rewards which come with making a measurable contribution to the organization.

The problem in this paradigm adjustment is that nobody is telling employees about the change in the measurements of success, nor are they communicating the employee's relative value to the organization. Helping employees measure their personal success in this new environment requires an emphasis on the new measures of success--team orientation, coordination, contribution, and expertise. As a manager, articulating the role of each employee in the organization and shaping the future of each employee is a challenge; it is, however, the hallmark of superior management.

Drawing on information from a multitude of sources outlined in the bibliography which follows this article, as well as from personal experiences at Datatel, the development of a skills matrix is recommended as the first step toward developing a world-class IT staff. The skills matrix serves as the cornerstone of workforce planning and retention.

Developing a Skills Matrix

Assessing individual competencies is an essential component in the development and retention of staff, particularly in view of the employee's need to be reassured of their value in the new organizational paradigm. "...many companies are beginning to define for employees what it takes to move to the next level by defining key behaviors, or competencies, need in their work force," according to the May 1995, *Personnel Journal*.

A skills matrix is a simple tool to allow you to assess the skill sets on your team. Begin by developing a foundational matrix which outlines the skills required for the organizational unit as a whole. Be certain to cover the most basic skills that are required in your

department, including telephone skills, problem solving, written communication, multi-tasking. Identify those items which are an essential requirement for all departmental employees.

When the foundational items are complete begin to develop a list of the more specialized skills required to meet departmental obligations. Think beyond your current staff. In fact, the matrix will be most valuable if you develop the skills list with a vision of what will be necessary to meet departmental needs three to five years from now. It may be that you have no one who has these skills today. The purpose of the matrix is to provide an eye to the future as well as a planning and development tool for today.

Once you have completed the complete list of skills, assign a weight to each item. Because of the broad mix of skills that any one individual may possess, it is difficult to assign weighting factors which total to 100 percent. Use scales of 1 to 5 or 1 to 100 percent for each skill. When loaded into a spreadsheet program, these weights will be multiplied against the respondent's answers and when totaled provide an overall score for the respondent.

Weights should be assigned to each skill by the manager prior to an employee completing the matrix. Weights should be the same regardless of the employee completing the matrix. The purpose of the matrix is to provide you with a view of the ideal staff, as well as a discussion point for developing a professional development plan for each employee. Weights should be kept off the employee's skills matrix instrument, so as not to bias employee responses.

While the employees are completing their individual assessments, the manager should be completing a departmental assessment and vision matrix. The manager should assess the current demands of the organization for IT support and outline on the matrix the level of and intensity of skill required to meet the demand today and three years from now. The projections on the manager's matrix will provide a benchmark for recruiting and hiring staff.

A spreadsheet application is ideal for data storage and manipulation of the skills matrix data. Session attendees will receive a sample of a spreadsheet matrix.

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Each employee's matrix should be weighted and scored providing the manager with a snapshot of the core competencies of the individual from employee's perspective. You will be amazed at the skills that will be uncovered through this process. Employees that you have filling a narrow role often have developed skills which would transfer to other departmental functions.

The individual skills assessments should be plotted with the managers vision matrix on one spreadsheet and totaled. This will provide individual reference points as well as an overall view of what it will take to develop a world-class IT staff.

Developing Individuals

Using the individual skills matrix responses, the manager should meet with each employee and review the responses. Together they can begin developing a professional development plan for the employee which meets their mutual objectives. The matrix provides a less personal entree into sometimes difficult discussions regarding the employee's position within the organization, as well as provides an opportunity for the manager to layout his vision for the employee over the next three to five years.

The review of the skills matrix is only the first step to achieving productive and happy employees. Regular, personal communication is critical to keep the employee focused and to reinforce the employee's value to the organization. At Datatel we use an instrument called a 90/90 review to stay focused on departmental goals and employee development. The 90/90 review was developed by Datatel manager Ron Tucker for use in managing Datatel's operations (or IT) department.

The 90/90 review is based on the philosophy that a manager should spend at least 90 minutes every 90 days working individually with employees. As the included sample review form illustrates, the 90 minutes of discussion is focused on the employee's accomplishments over the last 90 days, the development of goals for the next 90 days, and a review of professional development milestones and specific plans for action. Most Datatel employees enjoy the "no surprises" approach to the review process. Keeping in contact keeps everyone focused.

Developing a Departmental Plan

The skills matrix provides the data essential for the manager to prepare for the IT department of the year 2000. With a quantifiable view of how close or far you are from reaching your world-class view, you can develop specific strategies to bridge the gaps that were highlighted by the matrix. The data is also effective in justifying new staff in times of limited hiring, and threatened downsizing. The manager who can articulate the gaps in expertise and who can pair these gaps with the institution's requirements will be successful in attempts to build a world-class IT department.

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After IT Restructuring: What's Next?

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After IT Restructuring: What's Next?

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I. Introduction

In July 1993, DePaul University integrated its information technology and services functions under a new information technology division. This restructuring consolidated formerly fragmented services to achieve a unified direction for information technology aligned with university goals. In two years, the new division brought the university into a competitive technology environment of integrated network infrastructure and client server architecture. To respond to changing technology environment and maturing user community, in spring 1995, the division undertook a second restructuring effort. Four strategies were used to reposition the division: a) streamline functional areas for greater coordination; b) invigorate team leadership for shared responsibilities; c) initiate new cross-functional processes to enhance IT effectiveness; and d) implement a comprehensive communication and customer service program to forge active partnership with users.

This paper examines DePaul's experience after its initial IT restructuring and discusses the rationales and strategies for further changes to meet changing university needs. Two cases, network and client server support, are presented to illustrate the strategies and implications.

II. Phase One: Building Technology and Organization Infrastructure

My recent article on "Strategies for Restructuring IT Organizations" (Chan, 1995) provides a fairly detailed discussion of DePaul's first effort in restructuring its IT functions. In essence, five principles have guided the IT restructuring:

- focus on institutional strategic goals
- maintain IT organizational responsiveness;
- provide integrated information and technology solutions;
- develop an IT culture of learning organizations; and
- insist on flexibility in resource management.

The new division adopted a team-based, horizontal structure to achieve a unified vision, shared values, responsiveness to institutional change, and improved productivity. Seven small and flat functional groups were formed to replace formerly large, hierarchical, and separated departments.

1. Outcomes and Deliverables

This restructuring yielded many positive outcomes:

- networked 2500 users at five campuses
- standards for platforms, productivity tools, hardware, and network operating systems
- standards for client server environment
- a five-year telecommunications plan
- a new telephone switch for the Lincoln Park Campus
- consolidation of academic computing operating systems
- student and faculty microcomputing centers
- residence hall data & voice cabling
- enterprise data model for new student systems

- mainframe operating systems migration
- data gateway for client servers
- reengineered fund-raising process

2. Key Strategies

Core Values for IT Organization. Ten core values were introduced to unify formerly separated cultures and organizations. These values were incorporated into a new performance appraisal system as performance attributes: commitment to mission, continuous quality improvement, creativity and innovation, customer focus, leadership, openness to change, result-oriented, self-directed learning, self-empowerment, and teamwork and collaboration. These values helped to redirect staff's attention to the need for change, but have limited effect if not continuously translated into performance expectation.

High Performance Management. A new performance appraisal system helped to set performance objectives and review outcomes every six months. These objectives are linked to university and divisional strategies. This process motivated managers and staff to think and behave in measurable goals.

Cross-Functional Teams. We created cross-functional teams to support help desk, computing workshops, computing labs, and special projects. Team approach for ongoing support was less satisfactory than that for projects. Users were confused with the process approach. Clear objectives, outcome expectation, and division of labor are essential for team success. As a new organization, we underestimated the training requirement.

Reskilling of IT Staff. Multiple strategies were used to develop the soft and technical skills of IT staff across division. Leadership development programs, technical training on new technology for targeted individuals, participation in special projects, coupled with rigorous performance management, yielded high performance and productivity.

Partnership with Clients. Despite our effort in communication, the massive and numerous technology changes introduced in the past two years heightened users' anxiety as well as expectation. Communication and customer service did not meet changing needs.

3. Change and Transition

We carried out the IT restructuring as planned but had to address transition issues along the way to ensure staff retention. The impact of restructuring on people, both individuals in the IT division and users, was sever. Many IT members went through prolonged anxiety about changing roles, responsibilities, relationship with co-workers and users. Users expressed equal frustration about learning new skills and fear for job shift. It became quite clear that we had to address the transition process for individuals in order to implement the planned change. Transition management differs from change management in many ways (Bridges, 1993). Change is an external process, often driven by events, situations, outcomes, and external environment. It emphasizes a new beginning and intended results. Transition, in contrast, is a process internal to specific individuals. It has three distinct phases--ending, neutral, and beginning--and starts with the ending. We assisted individuals through formal learning forums and informal communication to acknowledge their loss and the pain associated with the restructuring. We also emphasized a project approach to help those individuals to establish early success in moving into a new beginning.

III. Phase Two: Expanded Information Access and Services

The rapid development of infrastructure achieved during the first eighteen months brought the university community to a new environment and heightened user expectation.

1. Rationale

Changing Technology Environment. The 1993 restructuring enabled the IT division to move the university from a lagging position to a competitive environment. Completion of the network infrastructure and new client server applications required the division to reposition itself as a service provider and a change agent, capable of improving work process through technology.

Changing Institutional Needs. The new technology environment afforded the university numerous opportunities to develop innovative strategies. Technology solutions became imbedded in academic and service strategies. The IT organization has to collaborate with user community and adopt a strategic view in selecting and prioritizing its projects in order to harvest the benefit of technology investment

Changing User Expectation. Our client base has tripled since 1993. Six to seven thousand students joined the user community in the 1995-96 academic year. Users of different proficiency level and needs further complicated the design of new service models. Measures of IT success shifted from infrastructure work to customer service, from technology solutions to our ability to vision and facilitate work redesign.

2. Strategies

We continue to follow the five principles, mentioned above, to guide this second round of IT restructuring. A four-prong approach was taken to improve services and information access.

Restructure and Streamline Functional Groups. The seven small, flat functional groups accomplished the advantages of empowerment, cross training, reestablishing working relationship, and consolidation of technology platforms and operation. However, coordination across division was still problematic. To allow better coordination and more effective communication with users, functions for the seven groups were streamlined to form four functional groups while maintaining the same unified vision and culture.

- Information and Application Support (IAS): Focused on client server, work process redesign and migration of legacy systems
- Network and Telecommunications: Full responsibility for voice and network support, including network software support
- Academic Technology Development: All instructional and research computing, instructional technology, and student Internet support
- Management Support: Focused on customer service, management practice, user communication and IT policy research

These changes gave each functional group a complete set of service responsibilities and accountability. Although an additional layer of managers was incorporated into each group, we balanced the organizational design by emphasizing team leadership and new horizontal processes.

Strengthen Team Leadership. This team, composed of the vice president and four directors, developed a heightened sense of shared responsibility through a commitment to priority projects, team problem solving, and management practice. This team was responsible for quality assurance and exercised a discipline in project planning, management, and customer service..

Develop New Cross-Functional IT Processes. Four horizontal processes were established to improve user support. Objectives and expected outcome of each process are clarified for each process group.

- Software Research -- Expertise from ATD, IAS, and N&T was drawn to research, evaluate, and plan software selection, acquisition and installation before implementation. This process helps to achieve knowledge sharing and improved delivery of network software upgrades and support.
- User Computing Training -- Each functional group was responsible for conducting user training workshops on a designated network software package. This approach establishes direct, personal rapport with new users. It also instills a division-wide, shared commitment for user training.
- Help Desk--The process is coordinated by N&T but all groups provide higher level support. New policies and procedures were established to ensure a single point of service to the user community.
- Customer Service--A customer satisfaction action plan was supported by all groups. Measures and benchmarks were established for maintenance functions as well as new initiatives.

Forge Proactive Partnership with Users. A customer satisfaction action plan was developed to articulate products, services and clientele. This plan includes eight components:

- university plan for information technology
- IT policy development process
- voice of the customer
- project management and communication
- customer satisfaction card
- customer communications
- operational performance measures
- rewards and Incentives based on user satisfaction

This approach enabled the division to design appropriate messages, communication strategies, and user support. Staff in the division received training in customer relations and communication. Besides various electronic and print communications, the division holds regular technology and project updates for users. Key user groups receive customized support.

3. Outcomes and Deliverables

- new voice services for 1700 resident students
- DePaul Online: Internet SLIP services for students
- DePaul In-Touch--campus-wide information access
- enhanced student bills
- student and user training and services
- suburban campus support
- faculty microcomputing service
- support for distance learning
- remote Access for faculty and staff
- enrollment management data warehouse
- extend use of legacy systems
- WWW applications
- data policies and procedures
- a new fund-raising and donor tracking system

- redesign of student-centered processes and systems

IV. Two Case Studies

The IT division responded to changing institutional needs in two phases of restructuring. The initial restructuring in 1993 was to create an organizational infrastructure for implementing technology infrastructure. The realignment in 1995 was to reposition the division as a service provider and change agent. How did the IT restructuring affect users? What are the implications of these rapid, massive organizational and technological changes for the IT division? The impacts of these changes are examined in two cases from several perspectives.

Case #1: Network and Telecommunications Support

In the network support arena, the completion of university network infrastructure at all campuses by early 1996 will bring 3000 faculty and staff users into the Novell, Windows-based environment. Completion of networking for student residence halls would bring over 1,700 students in a "port per pillow" environment. The DePaul Online could potentially connect the remaining 15,000 students with the university.
a shift from infrastructure work to provision of quality service--network operation, software support, help desk, and risk management--becomes a top priority. After the aggressive building effort, ways to ensure currency in technology and infrastructure become new challenges.

New Environment. Our client base nearly tripled since 1993 in an integrated network environment. We had to serve different generations of users; some are novice, some demand advanced technologies. Users now depend on the network to perform their tasks. They expect a stable work environment and a full range of free services. They view network standards and policies as signs of centralization in a traditionally entrepreneurial university environment.

IT Internal Conditions. The Network and Telecommunications group embraced the values of innovation and learning organization. They had little old technology to shed and quickly transitioned into the new work environment. They adopted a project management discipline and implemented networks at a fast pace. This in turn breeds staff expectation for new learning opportunities and career growth. Most of network staff valued projects over maintenance of network operations or user services.

Realignment Strategies. We realigned the network staff and service to meet user demand for reliable network performance and responsive services. The group was restructured into three sub groups--network operations, telecommunications service, and help desk. We moved technically oriented individuals into the network operations and staffed the help desk and telecommunications groups with people of strong service orientation and contact management skills. Several new members were recruited from other departments, such as placement service. The position of help desk manager was upgraded to confirm our commitment to service and the importance of a service-oriented career track within the division. We also created two cross-functional teams to support users at the two main campuses. Offices were reconfigured into an open space at the two locations to foster integration of voice and data services and personal contacts with users. Users are consulted to develop service standards and policies. Bonuses and performance appraisals were linked to user feedback.

Results To Date. While many of these strategies are still being implemented, user response has been extremely positive. Ratings for services during October and November 1995 showed more than 95% satisfaction. Timeliness in project completion received an a

rating of 86% satisfaction due to poor coordination in October. Improvement was made immediately and raised the November results to 95% satisfaction. Current members appreciate the parallel track of service and technology orientation. The redesign of work space was essential in making the realignment successful.

CASE #2: Client Server versus Legacy Support

In the client server arena, we are implementing an Oracle-Microsoft Access application to support reengineered fund-raising process. Object-oriented rapid prototyping and application development were used. We worked with consultants to rearchitect the enterprise data model for building an integrated student system. This two-year project, when completed, will replace home grown legacy systems. It is critical to develop new skills for application staff. How to target and motivate developers for these new learning opportunities while maintaining support for legacy systems is a delicate balancing act. In designing and deploying new client server solutions, we were also challenged by users' learning curves in using the technology.

New Environment. Our intensive effort in user training increased their knowledge about technology and information. Restructuring and reengineering in other university functions also raised their expectation for rapid technology solutions. Several user groups began to establish their IT support staff to cope with increasing dependency on technology. However, dependency on legacy systems continues as most of data still reside on the mainframe. Users showed mixed reactions to new client server applications; there was anxiety about steep learning curves and job shifts to be introduced in a client server environment.

IT Internal Conditions. Obsolete technology and gaps in skill profiles delayed our timetable to migrate off the legacy systems. Many individuals in this group attached their professional identify with the legacy systems and had trouble in transitioning into a new environment. There was also growing tension in resource allocation between on-going legacy support and new systems development. New systems demand skills and experiences that few possessed.

Realignment Strategies. The Information and Application Support group was realigned into four subgroups -- new systems, legacy support, systems administration, and production -- following the system life cycle. Any systems, regardless of technology or platform, would eventually move from new systems to the production phase. A complex system project would require support from members of several subgroups. We also developed a client server architecture (Unix, Oracle, Windows, Access), partnered with venders and consultants in systems development. To ensure project success, we also redesigned work space, created special project team rooms, emphasized user ownership in major projects.

Results To Date. Both users and IT staff experienced difficulty in transitioning into a client server environment. It would take much longer to achieve the desired change in this case. While these projects received much attention, it is important to maintain ongoing legacy support as the majority of mission-critical applications are still on the mainframe. Tension between the new systems group and legacy support had to be addressed promptly. Because progress in legacy support tends to receive less attention, special effort is required to encourage steady operations and responsiveness in problem solving. We sponsored many individuals for learning new tools. They did not always have opportunities to apply new skills immediately. It would be more effective to synchronize training with project assignment.

V. Implications

Reflecting upon DePaul's experience, it would be appropriate to view IT transformation as a process of managing at least three overlapping phases of change and transition. The first phase focuses on building organizational and technology infrastructure. The second phase emphasizes expanding information access and services for users. The third phase evolves around process innovation and integration, probably the most difficult to achieve. Each phase calls for different organizational design, skill sets, processes, and relationship with user community.

What we have learned is that IT restructuring ignites a process of continuous change, because the institutional context and the IT internal processes and dynamics are changing constantly. The challenge we face is how to expand our capacity to manage change and transition.

1. Successful Strategies

Five strategies have been critical to our ability to implement the transformation:

- A focus on outcomes and deliverables motivated the IT members to transition into a new environment and develop a sense of pride.
- Rigorous project management enhanced the success rate of on-time delivery. This discipline is adopted by all groups. Even routine maintenance tasks are now formulated as special projects to assure rigorous monitoring and timely completion.
- Flexible organization design, coupled with flexible staff and budget management, allowed the division to move nimbly in responding to university needs. A divisional perspective in resource management is necessary to avoid building new turf walls after initial restructuring.
- A discipline in performance management, linking individual's deliverables with divisional goals and project timelines is most critical in ensuring divisional performance. A reward structure that allows market adjustments and incentives for high performance prevented the attrition of some newly trained professionals.
- Adoption of a customer service attitude is a challenge for technical staff but our attempt so far has improved the division's image. Frequent feedback, direct communication, and personal contacts are keys to establishing relationship with customers. User feedback cards gave us quantitative evidence of problems, improvements, and user satisfaction.

2. Challenges

The pressure that higher education institutions are facing in the coming years will require IT organizations to embrace continuous change. An understanding of what this continuous but radical change, or transformation, is critical for IT professionals. These changes have sever impact on people and must be carefully managed.

- Transition management is not well recognized in a change process. Acknowledgment of pains and difficulties associated with change helps individuals to move toward a new beginning. Creating a work environment that ensures small but early success from day one helps build confidence in individuals for sustained change. Those in leadership positions should take a special effort in working with individuals during the change process to build trust.

- Restructuring should be coupled with continuous quality improvement to achieve sustainable results. Radical changes need to be implemented quickly to capture the momentum and energy. It is difficult to anticipate all the consequences of change, even in a carefully constructed plan. Incremental adjustments afterwards are appropriate to ensure services, quality, and impact on users.
- Adopt a transformation process for continuous change will become a key to successful IT operation. Alternating between redesign, restructuring, and slower-paced quality improvement can build long-term results. However, the pressure on high education may soon propel IT organizations to quicken the pace for continuous change. Developing the organization's and its members' capacity for IT transformation will be a challenge few can avoid.

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Transitioning the Organization: A View from the Inside

by

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Several colleges and universities are in the process of integrating their information resource providers by merging computing services and the library. Almost two years ago, Gettysburg College announced plans to create a new division of Information Resources (IR) comprised of computing services and the library. To facilitate the merger of the two operations, IR pursued a reengineering strategy. The result of this reengineering effort was an organization composed of six self-directed, process-oriented teams. The transition to the team-based structure began in January 1995.

Transitioning the Organization: A View from the Inside

Several colleges and universities are in the process of integrating their information resource providers by merging computing services and the library. There are a number of reasons why an institution may wish to pursue this strategy. These include the similar nature of the provision of information by each organization and how many futurist predict that more and more of the information that is provided on paper will be provided digitally in the future.

Almost two years ago, Gettysburg College announced plans to create a new division of Information Resources (IR) comprised of computing services and the library. To facilitate the merger, IR pursued a strategy-driven reengineering effort. The result of this seven-month task was a single organization comprised of six self-directed process-oriented teams. The teams represent a melding of the two organizations. Each team is comprised of staff from both organizations. The new IR division is responsible for the delivery of all computing and library services on campus, including telecommunications and media.

The transition process to the new organization has been underway for close to two years and is still very much a work in progress. In this presentation, we will describe the transition process. We will describe some of our successes and some of the pitfalls we have encountered. We also will attempt to forecast some of the upcoming turns in the road.

Where We Came From

To give you a thumbnail of the environment, Gettysburg College is a private, liberal arts college in south central Pennsylvania, approximately 80 miles north of Washington DC and about 60 miles from Baltimore, MD. Our enrollment is approximately 2,200 undergraduates. We are loosely affiliated with the Lutheran church. We will be 165 years old next year.

President Gordon Haaland and Provost Baird Tipson announced the decision to merge the computing and library organizations in December 1993. Provost Tipson described the reasons for the merger as the need for a flexible, streamlined organization to support use of resources in all formats, an organization well positioned to lead the campus community in new and innovative methods of using information technology.

In December of 1993, there were approximately 28 full time library employees supporting access to a collection of 400,000 volumes and 1,400 serials subscriptions.

The organizational structure was a traditional, hierarchical one. In technical services, for example, there were 4 layers of reporting plus a layer of student workers effectively making a fifth layer. Many employees had been in place for a number of years. There was a history of faculty complaints regarding lag time between request for a book to be purchased for the library collection and availability of that book within the collection.

In the computing organization in the fall of 1993, approximately sixteen individuals supported both administrative and academic computing needs on campus. About four years before the merger of computing and the library, the computing organization had been reorganized to merge academic and administrative computing. In addition to faculty and staff, there was a heavy demand for services from students. Every residence hall room had at least one ethernet connection per bed.

The computing organization was swamped by user requests. This organization had been in flux for some time. There was a tradition of individuals holding loosely defined positions where they were expected to fill several roles. For example, the bookkeeper running the computer store also gave training sessions on basic computer skills for first year students. Prior to the merger, the computing organization had a series of training sessions on TQM methodology and team dynamics. Both served them well as a foundation for this new organization.

The Reengineering Process

The reengineering effort was a top-down, strategy-driven effort. It attempted to simultaneously address people, organization, process, and technology. To facilitate the reengineering effort, Axiom, Inc., an international consulting firm, was hired. The analysis and planning for the new organization was conducted by a core team comprised of three IR staff, an Axiom consultant, and the vice-president of the new division, Dennis Aebersold. The authors of this paper were members of the core team.

To ensure communication and a steady flow of ideas between the central team and the rest of the organization, the core team met with an extended core team comprised of six to eight staff members several times a week. During these meetings, the core team would describe current issues and ask for input. The extended team provided an immediate response. Following the meetings with the core team, members of the extended team would hold meetings with other members of the IR division over lunch to discuss progress and solicit input. This information was provided to the core team for consideration.

One or two times a month, the entire division would meet to discuss the reorganization. The topics of these meeting ranged from the wording of the

mission statement to identification of activities performed by the organization.

As part of the analysis and design of the new organization, the core team conducted an environmental analysis of the division and the college to identify constraints and boundaries that could influence decision future decision making.

The core team also developed a mission statement that was agreed to by all members of the new division. The mission statement communicates the purpose and intent of the division to all stakeholders in the college.[1] A value statement was also developed. [2] These two statements provided a context for subsequent decision making by the project team. They were also used to build the new organization by conveying purpose and identity to motivate employees. These two statements were also a key component for developing the six self-directed work teams. In addition they serve as a guide in daily decision making.

With input from the entire division, a set of goals and enduring objectives were developed. These goals were based upon the mission of the new organization. After developing the goals, a set of measures was developed. The measures were to enable the organization to evaluate its performance against targets.

An employee opinion survey and a cultural assessment were undertaken to identify the strengths and weaknesses in the organization. The assessment also identified priorities and preferences for working conditions within the division. The assessment posed questions about the prevailing culture of the library and computing services organizations. The assessment sought information concerning what changes staff would like to see in the future.

The needs and values of the division's stakeholders were evaluated also. Stakeholders are defined as individuals and groups--both internal and external--who have a stake in the success of the division or who are affected by its actions. Stakeholders include faculty, students, staff, alumni, as well as residents of Gettysburg.

One charge to the core team was to innovate operations of the new division. To do

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[1] The mission statement is: The Information Resources division develops and provides information services and resources needed for the learning environment at Gettysburg College.

[2] The value statement is: The division fosters an atmosphere of open inquiry and continuous education for all members. This demands highly qualified, flexible and team-oriented members committed to excellence and the value of the educational experience.

this, rough-cut activity models were developed to illustrate how operations were being conducted. Clear and logical models of the major cycles of the organization--such as the beginning of the academic year or how an information resource was obtained--were subsequently developed. These cycle models represent the sequence of activities that need to be performed to achieve strategies. The models map what happens from the trigger that kicks off the cycle through the activities required for successful completion.

Organizational structure models were developed that would best support the activity and cycle models. The results of the cultural assessment were reviewed in light of generally accepted management paradigms to provide ideas for the structure of the new organization. An array of structures, ranging from a hierarchical model to a form of a matrix management to the present team based framework, was considered. The cycle models were reviewed to determine logical units of work. This analysis, along with the organizing criteria, became the starting point for preparing and developing the organizational structure. The core team decided to adopt a team based strategy for the new organization. The teams were to be self-directed and organized around specific processes. The teams reflected the six groupings of activities and cycles: training, selection, delivery, response, planning, and special projects. The organization could also create special projects teams that would exist as virtual teams and would be responsible for specific projects that generally fell outside the scope of the other six teams.

The roles, responsibilities, and skills that are needed to enable the new organizational structure also were considered. The members of teams require specific knowledge, skills, abilities, and personal characteristics (KSAPs). These KSAPs were identified and documented. In constructing the teams, attempts were made to match individual KSAPs with team needs.

The core team also created a measurement system based on the goals and the activity and cycle models. This measurement system was designed to allow self-correcting feedback to the organization so that it could pursue its strategic direction.

The core team developed a change management plan to direct and manage efforts to bring the new division to fruition. The transition was managed by a two-person transition team. The transition team was responsible for establishing the six self-directed work teams and fostering their development. The transition team was also responsible for providing training and obtaining resources that would be needed by the new organization during its early development phase. The transition team was the organization's first special projects team.

Transition Process: A Staged Process

We chose to implement the new organization as a staged process for a number of reasons. A key reason was practicality. We wanted to ensure success. We wanted to make sure we had sufficient resources available to address any unforseen problems. We brought up the initial set of three new teams in January of 1995 and the second set of three teams in June 1995. We also wanted to minimize any disruption of services. As part of the transition, we were operating two separate organizations.

During the initial stages of all the teams' implementation, a great deal of time was spent in meetings. The transition team met with each team twice a week. The teams met among themselves several times a week to sort out which activities were appropriate for the new team. Some individuals needed to shed activities that belonged with a different team. The teams needed to establish new ways of organizing work and new ways of interacting with co-workers. One individual made the statement that it felt as if she was involved in a marriage with eight people in it.

The transition team's role in meetings with the teams was to provide a forum for safe conversations. The meetings began with a state agenda. The transition team frequently adjusted the agenda to address immediate concerns as they emerged. Teams would sometimes suggest agenda items for inclusion.

The design of the meetings included a warm up activity. The topic of these warm up activities were drawn from *The Team Handbook* by Peter R. Scholtes, et. al. (1988). These warm up activities included such things as having each person talk about what they liked to do on weekends or talk about some aspect of their home town. Even though we thought these topics were not threatening , we found over time some individuals objected to them. In one instance, a member of one team became very upset and burst into tears about having to talk about that member's home town. In other instances, team members welcomed the opportunity to share at length moments about their early years.

Occasionally, the warm ups would last for more than half the time allotted for the team meetings. We found these sessions to be extremely useful as members of the team began to recognize their team mates as warm and caring individuals. The warm up activities were very successful especially with the larger teams who had not worked together very much before the merger. After the formal transition period was over, several individuals said that the most beneficial aspects had been the warm ups and the ability to shift focus from a planned agenda to address immediate concerns.

Following the warm up sessions, we discussed much of the aspects of the business process renewal project described above. These included a review of the mission

and values statements, the objectives and goals of the organization, and activities related to the particular team. We also talked about team dynamics such as communication, ground rules, decision making, etc.

After these initial topics were covered with the teams, the transition team tried to minimize its involvement with day-to-day activities of the new teams. Meetings with the teams were reduced to once per week. Subsequently the meetings were held every two weeks and the teams took shape. The topics of these later meetings usually focused on clarification of the team's role. In a few instances, these meetings were used to nudge the developing teams back on a course.

Lessons we learned

We learned a large number of things in the course of this transition. We found the experience to be one that resulted in a great deal of personal growth. It was also an invaluable experience in the management of change.

For those of you who may start down this path, we offer the following suggestions:

- *Don't allow individuals to be members of more than one team.* We had included some individuals on a short term basis on the initial teams, thinking we were temporarily over staffing them to help them get through the initial, difficult period. This was a failure--the short timers were not committed to the team, caused friction and interfered with the process.

- *Try to avoid hiring people as temporary members of teams.* We had a hiring freeze during the analysis process until we determined where the positions should go. We hired some people on a temporary basis which created some tensions. We are still filling those permanent positions. It is a pleasure to bring in new, enthusiastic, committed people. If at all possible, accelerating that process of identifying the needed skill sets and recruiting new people in with enthusiasm and without baggage would have been really helpful.

- *Resist the urge to fill every position as soon as it opens.* Wait until the teams are formed, then use the positions to acquire skills or abilities that may be missing from a team.

- *Take your time.* Be patient. There is no rush. It is more important to take the time needed to develop and nurture the teams than it is to declare victory.

- *Use outside consultants.* Do not hesitate to use whatever resources are necessary (and available) to bring in someone from the outside. Not only will

the outsider provide a different insight, but they also will not carry baggage.

We also had a number of successes we'd like to offer, too:

- *Warm up activities.* The warm up session probably did the most to ensure the success of each team. As facilitators, you can acquire a wealth of information about individuals about what they are saying; whether it is personal or not and how much they are willing to talk about it.

- *Use free flowing agendas.* Resist the temptation to cut agendas into stone. One technique that some teams use is to allocate a fixed amount of time to an agenda topic. As a result, the focus becomes completing the discussion within the amount of time devoted to it and not on resolving the issue.

- *Use meetings as sounding boards.* Allow the teams to experiment and challenge each other in the meetings. Encourage them to reflect on what they are doing at that moment, how they feel, and why. Gently encourage them to challenge their assumptions.

SOMETHING NEW!

A Bachelor's Degree in Information Studies

by
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Computer Science. Management Information Systems. These have been the underlying academic programs supporting the use of Information Technology on our campuses for over 50 years. Today, there is a new kid on the block. Information Studies!

This paper examines the past and looks to the future in dynamics in curriculum reform that is taking place across America as we prepare for the 21st Century and educate the USERS of information. We give credit to the pioneers of this curricular reform--Pittsburgh, Drexel, and Syracuse. MIS, Computer Science, and Information Studies are contrasted as academic disciplines. Highlighting the program will be a review of the core courses and electives that make up this exciting degree program. The audience will be given an opportunity to vote, in real time, for the critical courses from their perspective.

The closing will include a summary of costs for implementing such a program and the political and administrative hurdles facing "change agents" who dare to initiate a new program in a state-funded, research university in the face of declining budgets.

SOMETHING NEW!

A Bachelor's Degree in Information Studies

The ***information society*** had it beginnings in 1956 and 1957. In 1956, for the first time in American history, white-collar workers in technical, managerial, and clerical positions outnumbered blue-collar workers. Industrial America was giving way to a new society, where, for the first time in history, most of us worked with ***information*** rather than producing goods. The following year, 1957, marked the beginning of the ***globalization of the information revolution*** when the Russians launched Sputnik, a precursor of satellites which provide the missing technological catalyst in a growing information society, introducing the era of global satellite communications.[1] In the information society, we have systematized the production of knowledge and amplified our brainpower. To use an industrial metaphor, we now mass-produce information the way we used to mass-produce cars. The new source of power is not money in the hands of a few but information in the hands of many.[2]

The ***restructuring of America*** from an industrial to an information society will be profound. In the information society, change is occurring so rapidly that there is not time to react, instead we must anticipate the future. With this new society, there is a change in time orientation. That time orientation is to the future.[3]

In an information society, for the first time in civilization, the game is ***people*** interacting with other ***people***. This increases personal transactions geometrically, that is, all forms of interactive communications--telephone calls, checks written, memos, messages, letters and more.[4]

Ten years into the "information age," the U.S. Department of Commerce produced the first documentation of the ***information economy***. Through a painstaking dissection of the nation's economy and the establishment of criteria for categorizing jobs as part of the "information sector," some 440 occupations in 201 industries were identified as information jobs. This incredibly detailed study identified Primary Information Sector jobs such as clerks, librarians, systems analysts, and the like. In 1967, they represented 25 percent of the U.S. Gross National Product (GNP). A new information grouping called the ***Secondary Information Sector*** were the workers who produce information goods and services for internal consumption within goods-producing and other companies. This sector produced an additional 21 percent of GNP. The study concludes that the information economy accounted for some 46 percent of GNP and more than 53 percent of income earned. This was in ***1967!***[5]

We have for the first time an economy based on a key resource that is not only renewable, but self-generating. Running out of information is not a problem--we live in a ***sea of information***. For example: Over 7,000 scientific articles are written each day. And, scientific and technical information now increases 13 percent per year, doubling every 5.5 years.[6]

The Changing Workplace

Half-way through this century, work was comprised of tasks that were outer-directed, mechanical, and easy to supervise. Today, with the service-oriented, information economy

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[1]John Naisbitt, Megatrends, New York: Warner Books, Inc., 1982, pp. 11-12.
[2]Ibid., p. 16.
[3]Ibid., p. 18.
[4]Ibid., p. 19.
[5]Marc Porat, Information Economy: Definition and Measurement, Washington, DC: U.S. Department of Commerce, May 1977, p. 12.
[6]Ibid., p. 34.

dominating the developed world, it is an entirely different workplace. It is almost impossible to "supervise" information work. Mental tasks have replaced mechanical ones. "Work" is what goes on inside people's heads at desks, on airplanes, in meetings, at lunch. It is how they communicate with clients, what they write in memos, what they say at meetings. Peter Drucker points out that we are managing people paid for their knowledge. We have never done that, and we don't know how to do it.[7] The current Administration's emphasis on the "Information Superhighway" and building the National Information Infrastructure is very quickly increasing the speed at which America is changing.

Jobs in the Information Economy

The information economy is producing an extraordinary number of well-paying, challenging jobs. However, one must possess the required skills to do those jobs. The information economy jobs require a high degree of competence on the part of the individual worker. The U.S. does not presently have the trained human resources to fill those positions; nor will it for the rest of the 1990s.[8]

What is Information Studies?

The primary focus of Information Studies is the ***information user***. Questions of the field emanate from the behavior of the user and from the interaction of the user and information products, services, and organizations. The field's megaquestion is "how to most effectively link the best available information with the users who need it." Additional questions relate to the creation of information products, ***the satisfaction of user's information needs***, and the analysis of information content.

Since the 1970s, the field of ***information studies*** has been increasingly recognized as a discrete academic field of study, which is interdisciplinary in nature. It is becoming increasingly clear, as our society moves more firmly into the "information age," that there is a need for people with an understanding of the many facets of the information process--***from collection and storage to dissemination and use***. And, they need to have the technical skills to support that understanding. The professional and popular literature have begun to focus on the increased demand for individuals with skills in the information field, and several of the leading schools in the country have instituted undergraduate programs in response to this need.

An Historical Perspective

The FSU School of Library Science (SLIS) was established in 1947, as an outgrowth of the Department of Library Science, organized in 1926. At that time both undergraduate and graduate programs were offered. Bachelor's degree in library science were popular in the 1920s and '30s; for example, the Peabody Institute of Johns Hopkins University offered a Bachelor's of Library Science as a five-year program in the '30s.

An Overseas View

Most of the major universities in the United Kingdom with "schools of information and library studies" offer undergraduate degrees. In fact, the College of St. Catherine has been involved in undergraduate library science and information management curriculums since 1929.[9]

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[7]John Naisbitt and Patricia Aburdene, Megatrends 2000, New York: William Morrow and Company, Inc., 1990, pp. 219-220.

[8]Ibid., p. 42.

[9]Internet message from Mary Wagner, College of St. Catherine, March 5, 1993.

The University of Wales has three undergraduate programs--Information & Library Studies; Information Science; and Information Management.[10]

Shifting to Information Studies

Since 1972, the ALA has interpreted "***librarianship***" and "***library science***" in their broadest sense as encompassing the relevant concepts of information science and documentation. Whenever the term "libraries" is used, the current models of media centers, information centers and brokerages, information, documentation and referral centers are also assumed.[11] Called "***library schools***" since 1887, by 1972, when the current Standards for Accreditation were adopted by the ALA, the new term, "***information science***," had been added to the names of seven schools to create the combination "library and information science." One school preferred "library and ***information services***." These changes in terminology were intended to reflect the growing importance in library operations of what was frequently called the "new technology," or more specifically, information technology. This approach is also regarded as the "librarians" traditional role of viewing information from the users' perspective and assisting patrons to resolve their information needs. There was also the growing recognition that the training being offered in many library education programs would equip students to be "***information specialists***" who could serve effectively in settings quite apart from the traditional library.

No fewer than ***54 of the 59*** library education programs accredited by the ALA now combine "information science" or some other form of the term "***information***" with the word "library" in their name. And, at Florida State, the change was made to "***library and information studies***" in 1981.

Three programs have abandoned the very word "library." At SUNY-Albany, it is called simply, "information science," and at Drexel and Syracuse, the programs carry the name "information studies."[12]

ALA Standards for Library & Information Studies

The American Library Association, in its role to develop standards for the accreditation of library science programs, published its latest standards in 1992. In these standards, the most authoritative definition of the field is found.

> *The essential character of the field of library and information studies is concerned with recordable **information** and knowledge, and the services and technologies to facilitate their management and use. It encompasses **information** and knowledge creation, communication, identification, selection, acquisition organization and description, storage and retrieval, preservation, analysis, interpretation, evaluation, synthesis, dissemination, and management.*[13]

What Information Studies is Not

It is inevitable, when one discusses the need for an ***Information Studies*** program, that a comparison is made with ***Computer Science*** and ***Management Information Systems***. Certainly, these three programs need to work together to avoid duplication and overlap. Yet, the presence

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[10]Internet message from David Stoker, University of Wales at Aberystwyth, March 5, 1993.

[11]State University System of Florida, Program Review of Library and Archival Studies, Tallahassee, FL: State University System of Florida, October 1989, app A, p. 4.

[12]Ibid.

[13]American Library Association, Standards for Accreditation of Master's Programs in Library & Information Studies, 1992, Chicago, IL, January 1, 1993, p. 9.

of these three programs at one university offers synergistic opportunities for the faculty and students to work across programs for the benefit of all.

Information Studies is probably least like ***Computer Science***. As a reference point, consider the definition of that field of study from the *Classifications of Instructional Programs:*

> ***Computer Science***. *An instructional program that describes the scientific and mathematical study of algorithms used in designing and building computers, and their application to the development and design of actual computing systems. Includes instruction in computer architecture, assembly and programming languages, numerical and computational analysis, computer systems theory, artificial intelligence and cybernetics, and simulation and modeling.*[14]

Note that ***Computer Science*** places considerable emphasis on communicating with computers through programming languages. Thus, it is a look inward. ***Information Studies*** takes an opposite position of looking at the information that comes from computers. And, its consumers want not to communicate with the machines but rather understanding the information generated by the computer systems.

A program in ***Information Studies*** may appear closely related to a program offered by the College of Business, ***Management Information Systems or MIS.*** However, the "closeness" is evident in only a few words and phrases. Again, this is best illustrated by its definition as found in the *Classifications of Instructional Programs:*

> ***Management Information Systems and Business Data Processing, General.*** *An instructional program that generally prepares individuals to provide and manage data systems and related facilities for processing and retrieving internal* ***business information****; select systems and train personnel; and respond to external data requests. Includes instruction in cost and accounting information systems, management control systems, personnel information systems, data storage and security, business systems networking, report preparation, computer facilities and equipment operation and maintenance, operator supervision and training, and management information systems policy and planning.*[15]

The emphasis of an MIS program is on the use of information in a business or formal decision-making setting. The emphasis in Information Studies is broad, looking at the use of information across all sectors--public, private, and personal. Information Studies also is distinctive in regards to other disciplines in that its focus is on ***resolving user's information needs.*** It accounts for the hardware, software, and financial concerns but views the ***user*** as the ultimate evaluator of an information system's performance.

The Pioneers of Information Programs at the Bachelor's Level

In the past 15 years, only a few universities have taken the initiative to begin bachelor's programs in information "something." These institutional programs are described below.

1. The ***University of Pittsburgh*** established the first such program in September 1979. It offers a "***Bachelor of Science in Information Science***" which integrates knowledge from fields such as communications, computer science, cognitive science, math, philosophy, engineering,

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[14]U.S. Department of Education, loc. cit., p. 71.

[15]U.S. Department of Education, loc. cit., p. 196.

business and others. Its goal is to prepare students for careers in diverse and exciting information professions.[16]

2. ***Drexel University*** instituted its program in September 1984. A ***Bachelor of Science in Information Systems*** was developed "to meet the demand for individuals skilled in the development of information systems and in the management of information." This forward-looking program for undergraduates offers a solid background in liberal arts and sciences as well as skills and knowledge needed to design, create, manage, and effectively use modern information systems."[17]

3. ***Syracuse University*** began offering an undergraduate major in information studies in 1987 with its first ***Bachelor of Science in Information Studies*** being awarded in 1991. Students can follow one of four concentrations--Information Resources Management and Consulting; Information Research and Services; Information Systems and Telecommunications; or Paraprofessional.[18]

4. ***SUNY-Albany & North Texas State University*** have both developed heavily interdisciplinary bachelor's programs that use the "I" word. However, these programs appear not to be a high-priority for the schools. Yet, they are available if particular students wish to pursue them. At SUNY, the program grew out of an BS/MLS combination degree program and is now basically a bachelor's degree in Information Science, as of the Fall of 1989.[19]

Information Studies Curriculum Goals and Objectives

The goals and objectives for this new degree program were developed by the faculty of the School and approved in October 1995 by the University Curriculum Committee.

a. Information Studies Program Goal

To prepare graduates, within the context of a liberal arts education, with knowledge, skills, and values required to develop, organize, store, retrieve, administer, and facilitate the use of ***recordable information*** and ***knowledge*** and their management and use to prepare individuals for service within an information-dependent, global society.

b. Information Studies Program Objectives

- Develop an appreciation for the history, philosophical basis, concepts, theories and methodologies of information and collections of information.
- Understand principal types, functions, and organizational patterns of information service organizations.
- Appreciate the user's perspective, needs, requirements, and tasks in various information use environments.
- Provide the communication skills to effectively serve as information brokers and information intermediaries.
- Understand and utilize techniques of selecting, evaluating, and providing access to a full range of information resources.

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[16]University of Pittsburgh, Bulletin, Pittsburgh, PA, June 1991, pp. 31-43.

[17]Drexel University Undergraduate Curricula, Philadelphia, PA, August 1993, pp. 152-154.

[18]U.S., Congress, House, Committee on Science, Space and Technology, Hearings on Federal scientific and Technical Information Policy, "Testimony of Charles R. McClure, Professor, School of Information Studies, Syracuse University, October 12, 1989, p. 1.

[19]The Rockerfeller College School of Information Science & Policy Bulletin, State University of New York-Albany, Albany, NY, 1991-93, p. 5.

- Provide an introduction to the systems approach to problem-solving and the theories of information delivery systems.
- Provide an introduction to the development and uses of information resources, their general concepts, definitions and literature.
- Provide an introduction to the methods of information analysis and presentation.
- Understand the roles of systems designers, intermediaries, and information users in developing efficient and effective information services.
- Understand the cultural, linguistic, social, political, and economic implications of the information age.

The Information Studies Curriculum

The curriculum for the Information Studies program was developed over the period of two years. It draws on the curricula used at Syracuse, Drexel, and Pittsburgh. Copies of the course syllabus for all of their course were examined and related to the unique goal and objectives of this program. Additionally, the School's faculty played a significant role in developing the course list and syllabi for this program.

Students enter this bachelor's program after completing the state's Liberal Studies program and 60 semester credit hours of course work or transfer with a comparable amount of academic work. Thus, the students entering this program will be taking the last half of their 120 semester hours of course work.

Ideally, students entering this program will take the following ***core courses*** in their first year in the program.

FIVE New Undergraduate Core Courses:

- Information Science
- Information Sources & Services
- Information Needs & Preferences
- Technologies for Information Services
- "C" Programming Language for Non-Specialists

EIGHT New Undergraduate Elective Courses:

- Managing Multimedia Information
- Societal Implications of the Information Age
- Quantitative Methods in Information Studies
- Managing Information Resources and Services
- Usability & Usefulness of Information Systems
- System Approach in the Information Environment
- Network Administration for the Information Professional
- Natural Language Processing for the Information Professional

SEVEN Dual-listed Electives from the Master's Program in Information Studies:

- Information Services
- Seminar in Information Policy
- Theory of Information Retrieval
- Information and Image Management
- Managing Networks & Telecommunications
- Organization of Non-Bibliographic Information

New Program; New Students?

In developing new programs, there is always a concern by other academic units that their resources and even their students will be "sucked" into the new one. And, this could happen. First of all, the student growth at Florida colleges and universities is on the rise. So, adding programs is looked upon favorably by the State University System (SUS) of Florida and like governing bodies for the private sector. As more students come into the system, enrollment dollars follow. Thus, there are some assumptions made in developing a model of costs for such a new program.

First, there is the assumption that FSU will start out like the other universities that started these degree programs. So, data from Syracuse, Drexel, and Pitt suggest the program will start with about 30 students and double for the early years. Thus, by the end of the third year of the program, some 100 students would be in the system. These numbers are then entered into a formula on funding and tell the budget staff that the will be costing about $400,000 annually and generate over $500,000 in new monies for the university.

Secondly, it will take faculty and staff to put this program into operation. Again, following the normal build-up experienced by other universities, the program would generate 4.5 FTE faculty and 1.5 support staff. This will allow about 22 courses to be taught each year and adequately meet the demand of about 100 students. One of the new staff resources will be used to manage the new computer technology and the half position will be used to help with the administration of the new program.

Resources Essential to a New Program

As part of the development process, all of the resources essential to the implementation of a new degree program are evaluated. For example, a new program and 100 more undergraduate students will require additional library resources. The State funding formula provides the dollars for additional library materials and even human resources. Existing classrooms were judged to be adequate to handle the new group of students but additional laboratories would be needed. Additions to existing labs would include:

A doubling of the ***Computer Laboratory*** to 40 PCs. The addition of a ***New Technology Instructional Laboratory*** which will have one-of-a-kind new microcomputers and workstations, loaded with new or beta version software. A new ***Usability Research Laboratory*** is planned to develop and teach various aspects of usability and usefulness of approaches to ergonomics. It will also contain an electronic whiteboard and a video camera system to record testing sessions.

In addition to these facilities, the students will be able to use the existing labs and teaching facilities, which include: the ***On-line Laboratory*** contains the file server for the local area network, the network printers, and the documentation to support the on-line courses; the ***Cataloging Laboratory*** contains three OCLC terminals that are connected via SOLINET to the OCLC bibliographic utility; the ***Conservation Laboratory*** which is used to teach the practical aspects of conservation and preservation of books; a ***Graphics Laboratory*** that is used to teach practical methods of creating graphical items, such as passe-partout, drymounts, overhead transparencies, computer generated posters and signs, bulletin boards, etc.; and the ***Audio-Visual Laboratory*** which features audio visual (AV) equipment used in school media programs.

What do graduates of Information Studies programs do?

Now that the program is ready for implementation, a good question is, "What do graduates of Information Studies programs do?" Graduates of programs in information studies are employed in a variety of public and private sector positions that serve to ***link information***

users and information products and services. Current graduates work as information product and service designers and manufacturers and as independent information service providers.

Graduates are found in such areas as: information services & support; information specialist; network administrator/coordinator; planning services; technology licensure & testing; information systems services; educational information services; information support & analysis; reports & forms management; information program support; telecommunications specialists; network services; office automation specialist, end-user trainer, information product evaluator, information designer, information analyst, information technology planner, information researcher, data security specialist, usability analyst, on-line searcher, information broker, and Internet site architect.

Where do Information Studies graduates work?

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Taking Time to Train Students

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ABSTRACT

It is very easy to overlook the training needs of our student support staff. Many of us depend more and more on students to provide consultation support to end users. It is more difficult to train students because of varying schedules, turnover, and time constraints. Yet, in many cases they are our first line consultants.

This paper will present some useful techniques that University Technology Services at The Ohio State University has utilized when training students. Below is a brief outline of the major topics to be presented.

I Determining training needs

A. Customer Service
B. Evaluation of technical skills
C. Scheduling training

II. Training options

A. Typical Classroom
B. Independent Training
C. Self-directed Training
D. Apprenticeship
E. Role Playing
F. No Training

III. Costs & Support

A. Direct & indirect
B. Cost of not training
C. Management support

INTRODUCTION

As we become more dependent on the help of students, we also become more vulnerable to errors that can occur if they do not have adequate training to perform their jobs. Because of limited time and resources, we often hire students and provide only the most basic instruction. Using this technique, there are bound to be errors made when situations arise that they have not been trained to handle. Even if they do try to find the answer, their supervisor is all too often not present.

Consider the following case studies, they are real situations with names removed. I'm sure you have had similar experiences. The key is learning from these experiences to reduce the possibility of them occurring at your facility.

Case Study 1 - A customer calls the help line for assistance on a problem with his e-mail. Because the consultant was unfamiliar with the type of computer, the entire mailbox was deleted, instead of just one message. When the angry customer called back, he was told the supervisor would be in touch. The supervisor was on vacation for two weeks. You can imagine the result.

Case Study 2 - The computer center was shutting down a computer system because it's maintenance contract was very expensive. This decision was not too popular with many users who had become familiar with the system. One user posted a note to a newsgroup expressing his displeasure. An employee of the computer facility posted a message that agreed with the user and added some comments on an uncaring management system.

Case Study 3 - A customer had to go to a campus office to replace a lost access card. He arrived at the office at the beginning of the working day to find all of the employees grouped in the back of the office drinking coffee. He waited at the desk for several minutes before they finally broke up and retreated further back into the recesses of the office complex. Another 10 minutes passed before one student came out to one of the computer terminals and acknowledged his presence. He was unable to find the customer's record due to a "new computer system" and had to return to the recesses to find someone to help. The customer then had to provide his ID and had to fill out three forms with name, address, city, state, the make, year, model and license plate of his car, etc. The customer was given the incorrect change in the transaction and his ID was not returned until he asked for it. It is not difficult to understand why the office has such a poor reputation on campus.

I suspect all of you have had similar experiences. The damage to the image of the department is difficult to measure, but the outcome is not desirable. We know the need for training, but where do you find the time,

resources, and money to conduct the necessary training? Inadequate or no training can be very costly as well. In this age of change, downsizing, resizing and decentralization we need to concentrate on providing the best service possible. Our very survival may depend on how well we perform. Contrast this with businesses who are competing for your customers. Your local pizza shop knows your name and your usual order. Bank clerks have been trained to use customer's names and ask if there is anything else they can do for you.

Training students in good customer service techniques will pay dividends in multiple ways. The cost of training in the basics can be kept within reasonable limits. The following are some things you can do to keep the cost of training as low as possible.

Distribute the training responsibility across the department. This reduces the time required by any one person or group within the department. This can be made easier by conducting some train the trainer courses. This allows you to use some of your more advanced students to do the more routine training tasks.

Utilize existing courses. For standard courses there are a number of books, video, and computer based training courses available. You can also look at other colleges and university courses and see if they offer similar training. If so, ask to borrow materials and modify them to your particular needs. Browse the Web and Gopher systems of those institutions and see what is available on-line. OSU, for example, has all of our documentation on our gopher system. All of Ohio State University's publications are available at the following URL:

gopher://gopherjr.acs.ohio-state.edu:6051/11/DOCSGopher

Another example of using others work on Internet training is

this URL:

http://www.yahoo.com/Computers_and_Internet/

Internet/Guides_and_Publications/

In short, spend a little time to find what others have done and use whatever material possible. Of course ask permission and give credit to your sources.

Develop training in short modules and reuse the modules in multiple training courses. Use standard software for training presentations. This allows multiple instructors to utilize each others work. I will be "recycling" some of our train the trainer materials in this presentation. I also utilized material contained in "How to be a Better Trainer", a video course available from CareerTrack Publications[1]

DETERMINING TRAINING NEEDS

The most important need is to determine your specific training requirements. As the above examples illustrate, you may have both technical and customer service needs. We often concentrate on the technical side of training, forgetting that the customer service component may be the most critical.

Before you start you need to write down the objective for your training, answering the questions below.[2]

- Why are you conducting this training?
- What specific skill or knowledge do you want your students to have when your training is completed? Be sure to target gaps in knowledge or skills, not attitudes or morale.
- Who will be attending this training? How can you tailor the training to fit the schedules of the students?
- Logistics - How long will it last (number of hours) and where can are you going to conduct the training?
- How do the individuals feel about attending the training?
  - Survey the needs of the group
  - Give a pretraining questionnaire
  - Speak with a few of the participants
  - Provide outline of training prior to workshop
- Is the training going to be formal or informal?
- Do you have specific tasks or behavior you wish the participants to perform after the training?

Writing a lesson plan for training:[3]

- What is the content of the training in outline form?
- What materials do you need to present?
- How will you evaluate the competence of trainees?
- How will the training enhance their job performance?
- How will you evaluate the trainers performance?
- How will the students evaluate the trainers performance?

As I have mentioned before, one area of training that is easily overlooked is that of Customer Service. This is one area in which most students will not have had any formal experience. This is a critical issue since many times the students are the first contact callers may have with your department. Sandy Li, who spent many years in our Customer Service, area presented a paper on this subject several years ago.[4] In that paper she quotes the seven sins of customer service.[5]

Apathy
Brush-Off
Coldness
Condescension
Robotism

Rule Book
Run-around

While these may seem obvious, they are sometimes difficult to prevent, especially if your students are not aware of how to avoid them.

Technical skills are something that you must always be working on in the training area. In the computer world, it seems like major changes occur every day. At The Ohio State University we hold small "mini" training sessions of 1 hour duration on a regular basis to keep our consultants updated. Recently we held several on Windows 95, and how to modify our client server software. We also make the documentation on-line so that anyone can access up to date information.

TRAINING OPTIONS

Once you have answered the basic questions determining training needs, you must decide on the best delivery techniques. Some of this will be determined by your logistics, and whether the training is to be formal or informal.

When doing the design of the course, start with the key points and objectives you want to communicate to your audience and focus the training on those points. This is one of the main points made on certification courses designed for computer support professionals at the University of Indiana.[6]

Next you need to select the appropriate training methods, the most common is the old tried and true Classroom/Lecture. It is well suited for large groups, when you have factual material, and you want focus on the trainer. It is very economical in time and resources, which is why it is used so often. The disadvantage is it is not interactive. There are several ways to improve the standard lecture format. One technique is to call on volunteers to come up and do the computer demonstrations, or perform a similar task just demonstrated. This tends to prolong the demonstration, since the volunteer will make mistakes, but showing how to correct the errors is important as well. I also try to tell stories that relate to the specific area I am trying to teach, to bridge between the theory and the performance of a task.

Some individuals like the independent training method. Given a problem, they will go off and find the resources needed, and solve the problem. This type of training is very attractive to management, but it may not be the most efficient. Some individuals may not seek "experts" when they are stuck on a point and waste time trying to find answers.

Self-directed training is similar to independent, the individual is directed to books, video courses, self-paced computer based training. The Ohio State University has pulled together several of these types of materials and make them available through "learning centers", where individuals can make an appointment or check out materials. These include topics such as WordPerfect, DOS, Windows, Lotus 1-2-3, Excel and other popular topics.

Another technique, is the apprenticeship. This is normally used when you hire a new person and assign them a mentor who is located in the same office or very near. In this age of electronic communication you can do similar things by having an individual follow anothers posting to newsgroups or mailing lists.

A technique which I have found to be useful when training consultants is through the use of role-playing. I will break a machine in some way and have one person act as the person calling in with the problem. The other trainees will place chairs facing away from the person sitting at the computer and try to resolve the problem. We do a round robin with each trainee spending five to ten minutes trying to discover the problem. Since everyone can hear what questions are being asked they can build on previous questions. The consultants have found this very valuable, since they see how other consultants diagnose problems.

Of course you have the option of not providing training, but this will cause frustration and dissatisfaction among employees. In the long run it will be more costly for your department. If you see the need I feel it is worth it to do all in your power to see the training is provided.

COSTS AND SUPPORT

The cost for training is sometimes difficult to quantify. Employee satisfaction, lower turnover rate, better customer relations, and other benefits are a direct result of good training. There are many other direct and indirect benefits of well trained student staff members. In many customer service and consultation areas, it is possible to appoint an experienced staff member as a mentor to the students. Students can then observe the staff member, who can make them aware of the reason they deal with customers in a certain way. They can emulate the techniques of the mentor and provide good customer service.

It is helpful to have management support for training but there are many ways you can build training into your everyday working life. If nothing else, provide materials of various types and suggest projects that would involve the use of the materials. Encourage the active participation in conferences as presenters or session chairs. When returning from conferences, share with others in your facility the things you learned.

Implement at least one idea that you found helpful in a conference section. I recently returned from a training session on improving presentations. I took the highlights of those items I learned and worked with Gail Peters, the person in charge of Education and training at UTS, and turned it into a short one hour train the trainer session for our department. In this session I have included a mini-session on how to use Netscape for searching. I intend to use this same mini-session on Netscape, in some form, in several presentations throughout this year. The more you can reuse these small modules of training, the less "cost" you incur for the training.

SUMMARY

In this paper I have provided some general guidelines to determine your training needs. Once you have determined the needs, you can design the course based on the results you wish to obtain. Finally, decide on the best delivery system, keeping in mind that you can design the training to be most useful for a number of different training needs.

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[1] Helen Sutton, How To Be a Better Trainer, (Boulder: Career Track Publications, 1993) p1.

[2] Gerry Mitchell, The Trainers Handbook, (New York: amacom, 1993) pp. 186-187

[3] Thomal Leech, How to Prepare, Stage, & Deliver Winning Presentations, (New York: amacom, 1993) p. 85

[4] Sandy Lee, "Training Students on Customer Service Excellence," ACM SIGUCCS, Oct. 1991, pp. 191- 193

[5] Karl Albrecht, At America's Service, (New York: Warner Books, 1992) pp. 14-16

[6] Diane Jung-Gribble, "EDCERT: Education Certification for Computing Support Professionals", ACM SIGUCCS, Oct. 1995 pp. 169-173

TEAM TEACHING THE INTERNET: THE UNIVERSITY OF ARIZONA EXPERIENCE

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Arizona

ABSTRACT

The University of Arizona Library has forged partnerships with the Center for Computing and Information Technology and the University Teaching Center to develop Internet training sessions for our own staff, and for University faculty, students and staff. Utilizing both the staff expertise and the resources of each unit, we have developed a dynamic and effective program which assists members of our campus community in understanding how to access Internet tools and integrate Internet resources into their research, curriculum and classrooms. Teaching and learning models have been developed, first for our own staff and then for our users, which are continually modified based on our growing experience. Models are based on a conceptual framework which includes principles of adult learning in a constantly changing electronic environment. All of this has taken place amidst a background of organizational change which has provided a team-based library organization strategically positioned to respond to our academic communities' changing needs and directions.

Why are campus partnerships unique? Shouldn't collaboration among different academic units and departments occur naturally? Shouldn't we 'mix like peanut butter and jelly, fed by shrinking resources, common goals, shared interests and complimentary expertise?

What we have found at the University of Arizona Library is that the actual partnerships, once thought about and formed, are hugely successful. We simply do not think of each other often enough when assessing, planning and implementing programs. Creating partnerships requires a new way of looking at our campus resources, our staffing , our constituencies and our desired outcomes.

We abandoned the more familiar, but competitive model. We wanted and needed to share dollars rather than compete for them, to identify common purposes rather than differences, such as preparing our students for an increasingly information-based society. We looked not only within, but beyond our own units and departments for expertise, knowledge and training.

We are going to give you a specific outline of how our partnerships evolved. But because context is everything, we are first going to say a little about the University of Arizona Library and how we positioned ourselves for collaborative activities.

BACKGROUND AND REORGANIZATION

The University of Arizona Library is a large Association of Research Libraries(ARL) Library with a collection of almost 8 million items and a staff of 213 full time employees. We serve a campus community of 34,000 students, 26,000 of whom are undergraduates. Three years ago, we underwent a major reorganization. Existing departments were dissolved, reporting structures were collapsed, our physical layout was reconfigured. Nothing looked the same as it had before. It was an enormous and dramatic change. It was participatory, with most staff actively involved in the planning and implementation process. We are not suggesting that organizational change is a requirement for seeing and doing things differently. There are, however, several assumptions which shaped our

reorganization. We think many of these were designed to allow us to be strategically situated to meet changing campus needs.
The following are our assumptions:

* Continuous Learning is one of the hallmarks of our new organization. It is assumed that being prepared today does not mean being prepared tomorrow. Functions, responsibilities and organizational priorities will change. We value and support a dynamic learning environment.

* The organization itself is dynamic and will grow and change.

* User self-sufficiency is a goal. It is important to develop helpful interfaces and self-mediated learning opportunities, as well as training and instruction that encourages user independence or helps users develop the skills that will lead to more independent use of our resources.

* We are a user-centered organization where needs assessment, evaluation and planning are key.

* We are a team-based organization.

The organization moved from a hierarchical model to a flatter model with fewer administrators, departments and reporting lines. Within this new structure we created a team-based environment which stresses cooperation, consensus building and team responsibility for decision making and problem solving.

Every employee is technically "loaned" to their current team. Ann, for example, is loaned to the Undergraduate Services Team and the Science-Engineering Team, while Louise is loaned to the Fine Arts/Humanities Team. Team leaders are assured their positions for only three years, at which time the positions are open to rotation of staff. Special interlibrary teams, such as mission teams, process improvement teams and strategic tactic teams are ad hoc formations, designed to solve a particular problem, implement a particular plan, or move the library toward one of its stated goals. This structure was designed to increase our ability to bring together the talents, skills and experience needed to get a particular job done, to respond to timely issues, and to give people

the tools they need to thrive in a cooperative working environment.

It is in this team-based, user-centered, continuous learning, and constantly changing environment that we created our Internet teaching project It is in this environment our partnerships have developed and flourished..

Our Internet Training Program began with two librarians recognizing a window of opportunity and wanting very much to stick our heads through it. We knew that there was a strong need on campus to introduce both students and faculty to new technology and electronic search strategies. We knew the importance of integrating information and computer literacy into the classroom and curriculum. And we knew that our moment had arrived.

We formed--what else?-- a team of four librarians and set out to develop instructional materials and sessions which would effectively help train our own staff, capture the interest of faculty members, and be effective learning and teaching sessions for our students. We developed sessions which could be given by trained librarians. Because we developed models for each session, we were able to use them to train our own staff and also adapt them to our different campus audiences. We will describe the development and design of these sessions in more detail later. At about the same time the University's Center for Computing and Information Technology (CCIT) weathered a sizeable staff cut. Because both the library and CCIT were developing Internet training sessions, we decided it was time to join forces. What could we offer each other? The Library had two Electronic Learning Education Classrooms equipped with 12 workstations and a demonstration station. The design of these classrooms made them more effective teaching facilities than the classrooms at CCIT.

We had complimentary expertise and teaching experience. As librarians, we could draw on our past experience in developing and teaching the online catalog, database searching, and CD-ROM technology. We saw ourselves as the experts in understanding how information is organized, how to help users identify and locate appropriate resources, and how to help them think critically about the information they found. CCIT personnel had the

technical experience and expertise our users were demanding. They answer questions such as, "How do I set up an E-mail account or a Listserv for my class?" and "What kind of equipment do I need for remote access?"

Interestingly enough, we discovered we all were moving more toward understanding adult learning theory and instructional design. Working together to create the instructional models, develop the supporting materials and team teaching the sessions was an ideal collaboration. CCIT had also perfected month-by-month online calendars of training opportunities and we had a mailing list of all the departments, both of which enhanced our public relations efforts.

During this same time the University had embarked on a mission to "transform" Undergraduate Education. Faculty were being given both opportunities and resources to enhance their teaching skills. While teaching students was our ultimate goal, we knew that partnering with faculty members was also critical. If we taught them, they could then encourage students to make use of these resources and bring them into the library for instructional sessions.

In support of the University Mission, the University Teaching Center developed a series of five-week courses for faculty to help them improve teaching and introduce new technology into the classroom. They taught classes on issues such as learning theory, cognitive development and presentation software. They asked the Library and CCIT to team teach sessions on the Internet. This was an opportunity for us not only to teach Internet skills, but introduce examples and ideas for integrating electronic access and critical thinking skills into the classroom. We also asked that the Teaching Center critique our work. This request led to some significant changes in our instructional format. We invited the University Teaching Center staff to develop a series of sessions for librarians and CCIT personnel on such topics as adult learning and instructional design.

Based on our work with the Teaching Center and CCIT, we were asked to participate in a two day retreat on Teaching and Technology for University faculty. Here a blending of faculty from many academic disciplines, the

University Library, CCIT and the University Teaching Center came together, and through workshops, demonstrations, brainstorming sessions and discussions, explored methods of teaching. This was a very key development for the library, because here were the people in the University interested in, invested in and motivated around using technology to enhance teaching.

PROGRAM DESIGN

In the fall of 1994, the Center for Computing and Information Technology (CCIT) and the University Library teamed to design and create a series of Internet workshops. By combining the strengths of the members of each unit, both CCIT and the Library hoped to reach more students in a more effective manner and have a larger pool of instructors to draw upon. This workshop would be offered in the library's electronic classrooms and be taught by two people working together, one from CCIT and the other from the Library.

The collaboration began when a group of four librarians and three of the staff from CCIT met to compare current class designs, methods and handouts. The librarians also brought examples of handouts from other libraries. From this material, the group chose the most relevant, adding local information, discarding duplicate materials and combining the rest into a coherent whole. One of the CCIT people created a slide show using Powerpoint; the librarians created handouts detailing features of Gopher, Veronica, the World Wide Web, File Transfer Protocol(FTP), Listservs and Accessing Online Catalogs. These handouts were designed not only for participants to take for use after the workshops but also for instructors to use as outlines for their presentations.

The first session designed was an overview of the Internet, an introductory workshop where participants would get a taste of what could be found "out there". It began with an introduction to the Internet, including a brief history, the concept of the Internet as a virtual community and a realistic picture of what is available. The ideas that we are all learners and teachers who should be approaching the Internet with the spirit of discovery were emphasized. This portion was designed to be

about 15 minutes long.

Short demonstrations with brief descriptions of each program or concept took up another 30 minutes. These demonstrations at first consisted of why and how to subscribe to Listservs, connecting to online catalogs and using Gopher and Veronica. The World Wide Web, FTP and WAIS were mentioned if there was time. Once participants had been introduced to various aspects of the Internet by listening to the introduction and watching the demonstrations, the tactile learners were addressed by allowing about 30 minutes for practice. To guide participants, they were given the option of trying some practice exercises or exploring on their own. Presenters changed roles, becoming monitors, to assist hands-on learners.

Also in the initial design, 10 minutes were reserved for discussion on how the faculty in particular might use these resources in their research, curriculum development and/or teaching. Issues such as gender bias on the Internet and ideas like building your own Web site were to be explored. Five minutes were reserved for a summary of what was learned, mention of current trends and issues and announcements of future sessions. An evaluation survey which asked for feedback on the amount and type of material covered as well as suggestions for future sessions was also included. This is not how it usually worked out in reality.

IMPLEMENTATION

Staff training is the most important element in implementing any new service. Veteran instructors from both CCIT and the Library teamed to teach the initial sessions. Other CCIT staff and librarians attended sessions to familiarize themselves with the flow of the session and to gain confidence in their own teaching abilities. The first workshop was actually piloted by presenting it to library teams and asking for feedback. To foster the sense of discovery and the realization that we are all learners, librarians were encouraged to assist by keyboarding and being available during the practice sessions. It was hoped that many more librarians would gain the confidence to join the ranks of the instructors. This has yet to be realized in full measure, though the number of

instructors from both CCIT and the Library has grown.

With the speed of change on the Internet, the original concept for the Internet Overview changed as well. By the spring of 1995, based on returned evaluations, the Listserv and accessing online catalog demonstrations had been relegated to the introduction. The new standard Introduction to the Internet session now consisted of the introduction and alternating brief demonstrations with hands-on practice sessions. The demonstrations included Gopher, Veronica and connecting to the World Wide Web using Lynx and Mosaic. A separate session on Listservs also debuted that semester.

The Teaching Center critique of an Internet session for faculty also brought dramatic changes to the way we taught the workshops. A better understanding of learning theory and learning styles drove these changes. The introduction, which had turned out to be closer to 20 minutes than 15, was slashed to less than 10 minutes. The demonstration/hands-on practice sometimes became guided exercise with explanation after the exercise and much more time was reserved for hands-on practice. The Internet sessions for faculty alone are now geared toward how the faculty can use the technology in their classes and research. The open Internet sessions, which have a more varied clientele, concentrate on accommodating different learning styles, fostering a spirit of discovery and instilling the concept of critical evaluation of resources. All variations of the Internet sessions are designed to build on the existing skills of the participants and to guarantee each participant will leave having had at least one successful experience during the workshop.

CONTINUOUS LEARNING AND TRAINING

Other changes have also occurred. Gopher and Veronica are no longer emphasized; Netscape has replaced Mosaic; concepts are taught using Netscape rather than Lynx. Sessions on creating your own homepage and an advanced Internet workshop debuted this fall to overflow crowds. For each change, the combined CCIT-Library team gathered together to design and create the new workshops. Team teaching is an expected and welcome aspect of this collaboration.

Our partnerships and programs continue, and continue to grow. This past summer, a librarian requested that librarians be appointed to the CORE Curriculum Planning Committees which were being formed to help revise curriculum in the University's foundation courses. A common core curriculum will replace several general education programs. These courses will be formed around the themes of Traditions and Culture, Natural Sciences and Individuals in Society. The charge to the individuals developing the courses includes designing a significant writing component for each course. Teaching critical thinking skills in each course was also an element in the initial charge. Librarians, CCIT and Writing Center staff sat on these committees to provide resource assistance in the development of the core courses. The librarians also presented four Internet workshops for these faculty. As a direct result of librarians' involvement, one committee changed its charge to include introduction of new technology into the curriculum.

FUTURE PLANS

Two new developments take us into the present and the future. One very exciting collaboration is the Faculty Partnership Fund. This is a $940,000 grant award which is being shared by the Library, CCIT, the Teaching Center and the Triestman Center for New Technologies. This partnership "functions under the umbrella concept of Faculty Development, an initiative that aims to provide a structure for assisting faculty who wish to adopt innovative interactive teaching techniques and procedures." [1] It emphasizes the use of multimedia, networking, simulation and exploration in the development of learning-centered education. Money is going to personnel, equipment, software and operations. The Library has received money to create a prototype information commons in our Main Library reference area. It will invite students to explore graphic, text, and multimedia software programs to support their own interests. Ethernet connections will be provided and the furniture will foster collaboration. We will also be able to upgrade one of our electronic classrooms with multimedia-capable workstations, color scanners and a variety of software programs . The classroom will be open in the evenings to faculty who are working on innovative teaching projects. This brings us closer to

our goal of being a truly learning library.

Finally, the library has mounted a strong program to enhance librarian and faculty partnerships. These partnerships will create research programs and assignments which integrate information literacy, with an emphasis on new technologies, into the classroom and the curriculum. Each Integrative Services Team, which contains the bulk of our public service librarians, is expected to develop at least seven new partnerships this year. A team of librarians and career staff are working to ensure the success of this project by creating a foundation of support services. Individualized assistance to improve skills in use of technology is available to our staff. Workshops on learning theory and instructional design are being planned. Resources both on campus and beyond are being offered. A variety of opportunities are being planned from shadowing effective teachers, to videotaping instructional sessions, to sharing effective models.

We feel that with this last initiative we have made a complete circle. We have identified our own needs and interests, found colleagues who share these goals, combined expertise, resources and creative efforts to develop programs to meet present needs and future goals.

1 New Learning Technology Spending Plan (Tucson: University of Arizona, 1995)

Supporting Information Technology - The Evolution of a Model

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Abstract:

Victoria University of Technology was formed in 1992 as a result of the merger of two Institutes of Technology. This merger brought together a diverse set of technologies, services and support practices.

The authors discuss their attempts to set up a centralised Help Desk to cover the geographically dispersed institution and the introduction of Help Desk technologies in an attempt to balance the demands of the customer with the available skills of the staff. Some approaches to raise the skills of information technology support staff to provide quality service in a distributed environment covering six campuses spread over a 50 mile radius are also presented.

1. Preamble - A Historical perspective of Information Technology Support

In trying to develop the appropriate model for the support of Information Technology, especially in a University environment, it is interesting to briefly examine the organisational development of computing and its support models.

Management of computing resources and their support needs have to a large extent been influenced by developments in technology. In the early days of computing, support was at a local level by the people actually using these highly specialised machines. As they became larger and more applicable to commercial and general applications, computer centres were set up to concentrate the large investments and the expertise needed to manage and support it. With the development of the personal computer, the "end-user" became more responsible for provising support. Then, as networks developed, support again became more centralised. Now, the technology is such that there is a need for support at the user or "client" level for the many minor problems that can occur due to hardware, software or local networking issues in the work place, as well as support from the centre by specialists. This support generally relates to the corporate or strategic systems and the corporate network. The central support services can also provide a valuable service in coordinating bulk or site software licenses, equipment purchases and setting procedures and standards to assist in standardisation of data models and software interoperability.

This paper is an abridged account of one new University's experience in introducing a Help Desk and grappling with improving support services during a time of uncertainty and rapid changes. It is not a unique tale. It may sound very familiar to staff from many Universities, especially new ones or ones where there has been a major restructure or a radical change in culture.

It is however our story.

2. The formation of a new University

Let us first set the scene by spending a brief moment introducing you to our infrastructure and organisational framework, which, by the way, is still in the process of developing its own identity and work culture.

The Victoria University of Technology (VUT) was established on the 1st Jan 1992 as a result of the amalgamation of the Footscray Institute of Technology (FIT) and the Western Institute (WI) - both located in the western metropolitan region of Melbourne.

FIT was a single campus institution founded over fifty years ago with a focus on Engineering, Business, Applied Science and Arts and at the time of the merger had about 7000 students (5500 efts).

Computing was provided through a central Computer Services Department (CSD), managed by the CSD manager who had an academically linked position. The CSD managed several computing platforms, supported the student administration system, the

main campus network and four central computer student laboratories. They ran a small computer shop, some training courses and provided limited technical support to Schools and departments. There was no Help Desk or any central booking or work scheduling system. Calls for support were rung through to operations, the central office or the workshop or to any individual the user could contact the Schools such as Engineering and Business ran their own computer laboratories and had their own support staff. Others, such as Applied Science and Arts also had their own computer laboratories and provided their own desk top computing support. Schools provided hardware repair services and assistance with networking, especially cabling. The administration, apart from student administration, used a mix of packaged support and external bureau services for computing support.

The Western Institute of Technology (WI) was 5 years young and had been set up as a new initiative in Education. It was established to provide a continuum of education from TAFE (community colleges) through to higher degrees. At the time of the merger, the Institute had three campuses, each about 15 - 20 miles apart, about 3000 students and was growing rapidly with many buildings (especially on the main campus at St Albans) in different stages of construction.

Information Technology support was provided through the Information Systems Unit (ISU) to support the administration and the Educational Computing Unit (ECU) to provide academic computing and networking support. Two physically different networks had been set up; one for administrative access and one for academic access. The ISU developed application software using Informix and supported various commercial packages. The ECU was part of the Faculty of Business. It had developed the academic computing network throughout the Institute and installed and supported about 15 computer laboratories (each with 20 personal computer). These were used by all Schools and departments.

The merger brought together a wide range of computer hardware including CDC, IBM, SUN, MIPS, Sequent, and Encore. Three networking systems were used: Banyan, 3COM and LAN manager. Personal computing at the Footscray campus was entirely DOS/Windows (and some OS/2) whilst at the other campuses it was a mix of DOS/Windows and Apple.

Following the merger the three different groups were merged into one department called Information Technology and Services and a new Director was appointed (from outside the University). Within this merged department three branches were established.

The CSD manager from the Footscray campus became the Manager, Computing and Networking Services (CNS) Branch, the former head of Educational Computing Unit from the St. Albans campus became Manager, Client Services and the former head of the Information Systems Unit from the former Western Institute became Manager, Administrative Computing Services. Each of these managers have University wide responsibilities for six campuses. The merging of the different cultures and the changes in the roles for the senior staff was achieved with considerable pain.

3. Establishing an infrastructure

During the amalgamation negotiations, it was recognized that the soon-to-be-established University required a number of fundamental services including:

1. a uniform and easy to use telephone system
2. a communications network that ensured the teaching and administrative processes functioned in an uninterrupted manner, and
3. standards.

Prior to the amalgamation, a Communications Steering Committee was established and was made up of the senior IT management, specialist subordinate staff, and knowledgeable academics as well as an external consultant (who was subsequently appointed as the new Director IT&S). This committee reviewed and implemented the necessary communications strategies to ensure that :

1. all campuses would have access to a common PABX service and
2. all campuses had communications links capable of accessing the central
3. administrative and academic systems.

Apart from the inevitable amalgamation politics, work practices continued at the campus level as they did before the amalgamation.

Following the merger, it was recognised that information technology in the University will be best served by identifying the principal functions.

These were identified to be :

1. developing and implementing administrative systems
2. providing a communications and network infrastructure
3. providing support to the University community for technology services;
4. developing and implementing information technology standards;
5. assisting in the enhancement of academic pursuit.

The current structure is based upon the acknowledgment of these functional requirements.

4. Culture Shock ? Consequential Work Practices....

With the changing structure, there developed in our IT Department a consequential change in work practices. Some of this was intentional owing to politics and personalities that needed time to assimilate to the new way, and some by necessity as a result of the impact many work activities had on the new and wider community. **However, the main focus was to provide the best possible service to our new University community.** What came before us were four key issues :

1. The necessity of getting to know the "new" opportunities that we all had inherited.
2. Learning to let go of prior ways of doing things and thinking about things.
3. Coping with radical change and ensuring people in our Department and outside it **knew** what was going on.
4. Perhaps most importantly, each of the managers in the IT Department had to appreciate their changing roles and scope.

These four issues still face us today - but fortunately, in considerably lesser degrees.

Change can be implemented softly and compassionately but with every intention that the change will go ahead, or, alternatively, change can be implemented in a very short

space of time with far more adverse and expensive results. Fortunately, the former has occurred.

To paint the picture a little more, since early 1992, the need to extend information technology services has escalated to an extremely high level. The network at our western campuses had to go through substantial change in order to cope with the new buildings and campuses being erected as well as coping with the increased network traffic between campuses. Although it is acknowledged that we may not be unique in this growth-intensive activity, it should be made quite clear that this is not an exaggerated portrait of growth we have been, and are, experiencing. Indeed, this growth has not slowed down and we believe will continue for some years. For example the last campus was opened at the start of this year (1995) and will be expanded next year. Additional buildings are being constructed or planned for at least three of the campuses. All of these require substantial additional network infrastructure and IT support.

5. The Evolution of a Model

The following are some of the practices adopted earlier to monitor change activities. Prior to the amalgamation the Western campuses had in place a pseudo help desk system using the PC-based Paradox® database software. All reported problems, requests for changes or requests for new services were documented, serially numbered, logged on a database, and assigned to a specific individual for problem resolution. A work authority or Job Request Form was developed. The system was primarily used to:

1. condition our clients to record their requests for changes and to have those requests approved by their supervisor
2. make the solution provider accountable for specific tasks assigned to them - a piece of paper with a person's name means a lot more than a verbal instruction requesting them to carry out a task.

The methodology was merely a call logging and assignment facility. Nothing more. The Footscray campus did not use any formal call logging or problem reporting facility prior to the amalgamation. All calls for assistance were taken on an "as received basis" and mostly by those who the clients chose to deal with.

After the formation of the University, and the establishment of the Department structure, as it is today, the Client Services Branch purchased a commercial Unix-based Help Desk package and put in place a project team, from its ranks, to implement a University-wide Help Desk system. It was decided that *Operation Help Desk* should first happen at the Footscray campus as there was no reporting or call logging system in place at that time, or prior to the amalgamation and the need to formalise support services was greatest on this campus.

Until the Help Desk was fully operational at Footscray, the manual form-based call logging system at St.Albans continued to be used. The New Help Desk system was utilised to log calls and to generate reporting for tracking and resolution purposes as the staffing mix on this campus was not skilled at a suitable level to provide a more responsive service to the community. Computer Operations staff (who had previously also provided counter enquires) were partly retrained and became the Help Desk Operators. There was no other choice of staffing in the Branch.

6. Key Issues

The following are some of the key issues which emerged in setting up the new services:

The scenario at this point was that the Client Services Branch was introducing a formal call logging system on behalf of the Department. Staff belonging to this Branch are spread across the five campuses and the Branch has functional responsibility for:

1. Support at the desk-top level
2. Staff training
3. Documentation services
4. End-user computing support
5. Standards and Procedures

It took quite a while for IT staff to recognise the need to formalise the way in which they worked and how they should offer support to the client community. Specialist staff continued to implement change without due regard for documenting their change activities with the justification that they were "too busy to do paperwork". Nor did they communicate any proposed or planned change with their peers in the same department.

The order of the day was to get the job done - it was URGENT. There was an air of need and urgency. The University had to become operational within a very short time frame. New campuses were being commissioned, new buildings going live, students being enrolled. All required the involvement of our Department. At the same time, the Department was providing support to everyday problems and requests for service modifications and installation of new technology.

The Help Desk, in the meantime, became known as ***The Disaster Desk***.

Help Desk staff had absolutely no idea what was going on. All they could do was log each call and forward the problem report to the relevant section leader. There was a lot of activity happening around them, but nobody was keeping them informed of what was going on! Growth and change was occurring in too many areas. Criticism was being received from many sides of the organisation - from all campuses. On the one hand clients wanted a solution to their problems within the shortest possible time to meet deadlines they were expected to adhere to; and on the other side, limited funding and limited staffing in the IT area necessitated quick fixes, identifying and implementing solutions that caused the fewest problems, and so on.....

7. Reviewing the Work Model

Although initially there was no formal problem resolution or change management, a number of structural and resourcing changes have been implemented since early 1993. As part of our growth and establishment cycle, we had identified the key actions which would need to be taken to assist our situation.

What became apparent, was the need for prompt notification of problems and the need for prompt resolution to those problems. There was so much change happening on all campuses, a lot initiated by the central IT department itself. **Prompt attention to fire-fighting** was the order of the day.

The Help Desk was not fully utilised as a central reporting mechanism. Problem logging was still happening at the campus level with no consolidated reporting. Specialist IT staff still preferred to receive resolution requests from their clients as well as manage their own problem resolutions according the priorities they each set for their work load. The Help Desk was used only to assign problem calls if the clients chose to report their problems to the respective campus-based Help Desk.

We found that while each section in IT agreed that a central call logging facility was necessary, those same sections did not recognise the need to effectively communicate activities they each were involved in. For example, changes were being made to the network infrastructure and field support staff were not being kept informed of those changes. The work culture in the Department needed to change, and change very quickly.

It became apparent that it was not possible to approach problem resolution or new activity or change activity without effective communication between and within the Branches. We can say quite candidly, that an organization can buy the best technology, spend many thousands of dollars to implement it, but that organization will not survive unless the surrounding infrastructure and attitude is in place and its staff members are attuned to the needs of the client community.

Many of the staff in the IT department were anticipatory of the Help Desk solving all of the Department's communication and priority setting problems. Typically, they expected (and a some still do) the new software to overcome all of their procedural and communications problems as well as their problem and change priority and resolution needs.

In the course of this new growth period, a number of approaches and actions were attempted as measures to overcome apparent communication and resourcing problems. Most of these are now in place or in the process of being implemented.

ACTION # 1 - New Account Manager Positions

At the St.Albans campus, some changes were made to the department's staffing profile. Some of the part time staff salaries budget was translated to provide a limited number of established positions. The key responsibility of these "new" positions was to "account manage" or represent specific client groups.

1. Day-to-day requests for general assistance and reporting of problems, however, are still placed through and processed by the Help Desk.
2. The representative is required to follow through on any outstanding issues or planned activity that has an impact on IT services or where IT services needed to be changed or implemented that could impact the representative client group.

This model has been very well received and was eventually also adopted at the Footscray campus once the various other actions referred to below were implemented.

ACTION #2 - Establish a Works Review Group

Whilst it was fine to log all calls for assistance on the Help Desk system, there was no built-in mechanism within the Help Desk package that could be used to actually manage changes. A separate procedure was deemed necessary.

A **Works Review Group** was set up and met on a weekly basis bringing information, from each Branch, of planned changes or new activities for review, discussion and feedback. The objective was for relevant feedback to be taken back to the Branches for consideration in their respective project planning activities. **This initiative failed.** Managers did not want the group to determine priorities for projects proposed by or belonging to them. Review group members did not have the background skills to appreciate the impact of proposals brought before the Group; and those that should have attended were needed to work on projects on other campuses, and so forth, and, others just simply forgot to attend!

ACTION #3 - Facilitate Communications

As an interim measure, each Branch set up a generic e-mail box to post instructions and activities such as project timelines, warning message about changes or hot spots, for their staff (who were spread across different campuses). This had an auto CC facility so that other branches were automatically informed as to what was occurring. Since then a more formalised Bulletin Service has been set up.

ACTION #4 - Establish Training and Development Facilitators

We have now established staff training and development **facilitators.** These individuals have become the Branch consultants for each particular software package such as Word Processing, Electronic Mail, Unix, and so on. Their role is to identify the skill levels of Branch staff as well as build up their own levels of expertise in a selected platform to enable them to provide advanced or consultancy-level support.

In addition, a process has begun where every staff member in the Services Branch must go through an intensive training program to provide them with the necessary skills, up to an intermediate level, on every software application package the IT Department supports for Desk Top computing - including a small range of utility software that will assist them to effectively troubleshoot general media, hardware and software problems occurring on the client's desktop. This training covers both the DOS (Windows), UNIX and MAC platforms. There are some exceptions such as SPSS and ORACLE for which specialists are available.

Essentially what has been set up is a grid type skills set. Each support consultant has been allocated one of the most commonly used desk top application packages in which they must become proficient to "expert" level. In addition they must all know the basics of most of the commonly used application packages.

The introduction of this was different from the previous approach to support and is still being refined.

ACTION #5 - Expand the Client Training Program

An intensive client training program was initiated to build up the basic IT proficiency of our clients to a level that we hope will decrease the number of support requests logged by the Help Desk and thereby progressively reduce the Help Desk resourcing issue.

As an information technology provider, whether we like to admit it or not, we impose certain technologies upon our clients. We therefore have a responsibility to build our clients' skills up to at least basic proficiency that will permit them to carry out their normal duties and not feel threatened by the new technology they are increasingly being introduced or exposed to.

Although the number of calls to the Help Desk has still not dramatically reduced, the complexity of calls being logged for prompt resolution has increased placing even more load on the Help Desk, especially on the skills base required. Hence the need to develop expert skills for the Help Desk staff.

ACTION #6 - Establish the Central Help Desk

The University, like most other organizations, has suffered financial restraint. In turn, the bigger money spenders in the organisation have suffered. Our department falls into this category. With the accelerated growth and extent of change our IT department has been involved in, the allocation of funds toward infrastructure support and growth was, and still is, substantial. We are, nevertheless, seen as one of the bigger money-spenders. As with all IT departments we have not always been successful in obtaining funds for all of the necessary infrastructure-related projects which we (and often the users) believed were "necessary".

The increasing client base, the spread of the client community, the increasing complexity of problems, and the increasing need to introduce new technologies to the desktop were not matched with the number of people in the IT department who had to provide or support the services. As a support department we have a responsibility to accommodate the client's expectations and needs without compromising the quality of support. Field support services on each campus are, however, stretched to the maximum. Establishing a central Help Desk then became essential.

Setting up a campus-based Help Desk was, we believed, an expense which could not be justified, even though it was often requested by the clients at those campuses. By centralising this service, it was possible to place more staff out in the field and get them sufficiently exposed to their community as well as rostering them on the Help Desk - in this way, we believed that the Help Desk has become more empathetic to the needs of the client and has enhanced the support skills needed to resolve a greater percentage of the problems being reported to the Help Desk without referral to a field consultant.

It has also been possible to roster support staff to perform duties on several different campuses. In this way they are exposed to the nuances and perhaps the culture of each campus, thereby enhancing their technical skills, their people skills and therefore the overall service quality, taking their blinkers off and exposing them to a wider and more

interesting sphere of learning, tasks and people. Not setting up the campus based Help Desks has also provided financial savings.

8. The Help Desk - Why So Much Attention?

Earlier we put forward the premise that the focus of the Help Desk is in the process of changing and, as an industry, our reasons for establishing Help Desks are also changing. Let us now attempt to explain this.

Whereas in the past we have been concentrating on implementing technology to improve the performance of other technologies, it is proposed that the business focus itself is now being changed, and that revised focus is to improve the technology so that the level of customer service is improved. Perhaps this is a result of the international focus on quality and continuous improvement.

As IT professionals who have been in this industry for a long time, we should remember that he people who took advantage of our skills or services, or works of art ie systems we developed, were called or referred to as USERS. Some of the common phrases included:

"...get the User involved..."
"...have you spoken to the users ?...."
"...user involvement, ..." , etc

The more common reference to those same *users* is now Customers or Clients.

Our focus as IT professionals must change because our customer-base has changed and perhaps for the following reasons:

1. Technology improvements,
2. World trends to improve quality and service levels,
3. Economies in Recession., and
4. Technologically better educated customer base.

We must never lose sight of our customer. Our Help Desk exists solely to serve the customer, not the Help Desk staff.

The Help Desk must no longer be viewed as a poor relation in the Information Technology support area. It plays a key role in the provision of support and can be viewed as the representative of the IT Department as it regularly deals with issues where the work gets done. Information collated by the Help Desk can assist trainers and documenters to identify pockets of staff who require training or additional support documentation. Indeed, your Help Desk facilitates a pro-active service approach.

9. Tools of Trade

The Help Desk is only as good as the people who staff it and the tools they have to work with. There should be no compromise or shortcut to this premise.

Without a doubt, your Help Desk must be attended by skilled and field-exposed staff who can relate to the customer's problems or concerns and can offer solutions to those needs or problems for the majority of calls received. The Help Desk can not be expected to solve every incoming call for assistance so it is essential that Help Desk staff possess

a high level of inter-personal skills to handle difficult callers and sustain a high level of customer satisfaction. As it is important to have skilled Help Desk operators, it is equally important to have effective backup support who will be called upon to provide second level support in the field.

Some of the technology that can assist the Help Desk to cover peak call-in loads or to be used as resource-assisting backup equipment include:

1. fax-back information - customer service,
2. Interactive Voice Response technology - cover peak loads or after hours access,
3. pager messaging - prompt field support,
4. On-line services - WWW and gopher services and
5. Automatic Call Distribution - better a human voice than an answering service.

10. Marketing Your Help Desk

Promote your service to your customers and do it effectively. Make certain your support service facility or your Help Desk is recognised and has full support of your management and your management's management.

Once you are comfortable with the physical Help Desk setup and resourcing, implement a marketing strategy that will promote your services. Make certain that you have the correct infrastructure in place to sustain any increase in support requests. You only get one shot at your customer and if your marketing, plan fails because your Help Desk could not meet the increased demands resulting from your promotion, it will take a very long time to regain your customer's confidence, let alone support for future ventures or collaborative activities.

Some techniques you can use to promote your Help Desk include:

1. short seminars,
2. publication service,
3. "How to .." tips for services in your publications,
4. Providing summary statistics,
5. Making your clients aware of operating procedures,
6. Conducting customer surveys and
7. Talking to your customers

If the quality of your support is acceptable to your customer, we suggest they would not object to paying for any extras. The Help Desk will continually be expected to maintain the same level of service to the ever-increasing customer base and at the same time not receive any additional resourcing.

Some of the tools and techniques mentioned above will help you to develop a better or more thorough understanding of your customer's needs.

11. Service Level Agreements (SLA)

As more services are expected by the client, funding for those services need to be met by somebody, either you or the client. Service Level Agreements can formalise the support levels as well as ensuring the availability of resourcing necessary to meet those levels.

SLAs are also very effective mechanisms for quality reviews, either by your customer or by the service provider. Ideally this would be done by both parties meeting regularly to conduct progress reviews of service received and provided. SLAs are one very effective step in ensuring your Customer's expectations match the quality of the delivery of services you have agreed to provide.

12. "Customer-Care" Program

A "Customer Care Program" is a valuable approach to formally letting your customer know that you are there primarily to help them resolve problems arising from the technology they need to carry out their business. If new staff to the organisation are made to feel that they can get assistance and are welcome by the technology staff, they will be much more understanding when problems arise. One approach to get them on-side is for the IT staff to:

1. Adopt a Customer Care philosophy and promote it as one.
2. Do a deal with your Human Resources people and have them notify your Help Desk when a new person starts employment.
3. Have the Help Desk introduce itself and the services it provides to those new incumbents.
4. Send out an information kit with useful names and contact telephone numbers.
5. .....make new starters feel welcome.

13. "Frequent-Caller" Program

Study the reports generated out of the Help Desk system and identify customers who are frequent callers. Find out why they are frequent callers and carry out a telephone survey or personal visits to get to know your customers. The aim is to place a face to every name.

14. TQM & Continuous Improvement

The quality of the overall service your Help Desk provides to its customers is only as good as the understanding the Help Desk has of its customers. Some techniques that could be adopted to ensure that quality and continuous improvement remain at the forefront of your Help Desk are:

1. Regular meetings with Help Desk Staff
2. Posters in the Help Desk Room
3. Help Desk staff to meet their Customers

The Help Desk can facilitate Continuous Improvement by providing reports with vital statistics highlighting inefficiencies.

15. In Conclusion

Our story is not finished. The University is maturing. Partly as a result of the training put into place and the increasing sophistication of customers, calls to the Help Desk have started to reduce, but, as predicted, many of the calls are now more complex and take a higher degree of skill to resolve. The Help Desk staff have risen to the challenge and have participated in most of the training, including training in answering telephones and other inter-personal skills. The Help Desk has lost its name as the "Disaster Desk" and is now considered an essential part in providing support services to the client.

The University is starting to establish a good reputation for innovative courses and a good Information Technology infrastructure for its students, who are after all the real customers.

Postscript
Norbert Riedl has since left the Victoria University of Technology to become Director of Information Technology Services at the University of Melbourne which is Australia's leading research university, has about 30,000 students and over 5000 staff.

The IT support model used at The University of Melbourne is a two tiered one. Schools and departments are encouraged to become as independent as possible in the provision of direct desktop IT support to students and staff. The ITS department, has responsibility for the core infrastructure such as telephones, the campus network, administrative systems, large timeshare computers (including several High Performance Computers) and runs an extensive IT training centre providing training to staff and graduate students. **ITS also runs a central Help Desk**. All departments are encouraged to employ (or train existing staff) to be Local IT Experts (LITES) and Local Area Network Administrators (LANADS). Sometimes they are the same person.

The Help Desk primarily supports the LITES and LANADS. Although other staff and graduate students may call the Help Desk they are general referred back to their local LITE unless it is an emergency or the departmental LITE is not available, or is unable to resolve the problems. Over 85% of all problems can be generally be resolved on the direct call to the Help Desk without further assistance. Where it can not be resolved it may require a return call or be passed on to an expert in ITS who then becomes the consultant to the problem.

ITS also runs forums and provides specific training and information to LITES and LANADS improve their expertise. Extensive use is made of an extensive CWIS (using Netscape) to disseminate the information. ITS via the University IT Policy Committee develops the standards and policies on support and annually requires all LANADS to certify that they are administering servers in their areas according to the standards. This certification process is audited by the University internal auditor.

The model is a little different from that at the VUT, but works well for a large institution. It has its shortcomings but is constantly being improved.

It is our aim that the IT support at the University of Melbourne is adaptable and allows the clients to maximise the use of the very extensive IT facilities in the pursuit of academic excellence, for which the University is renown. We wish to retain our place as a leading research University and are using IT as a strategic tool in the process. This requires support services of the highest standard and continuous improvement.

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